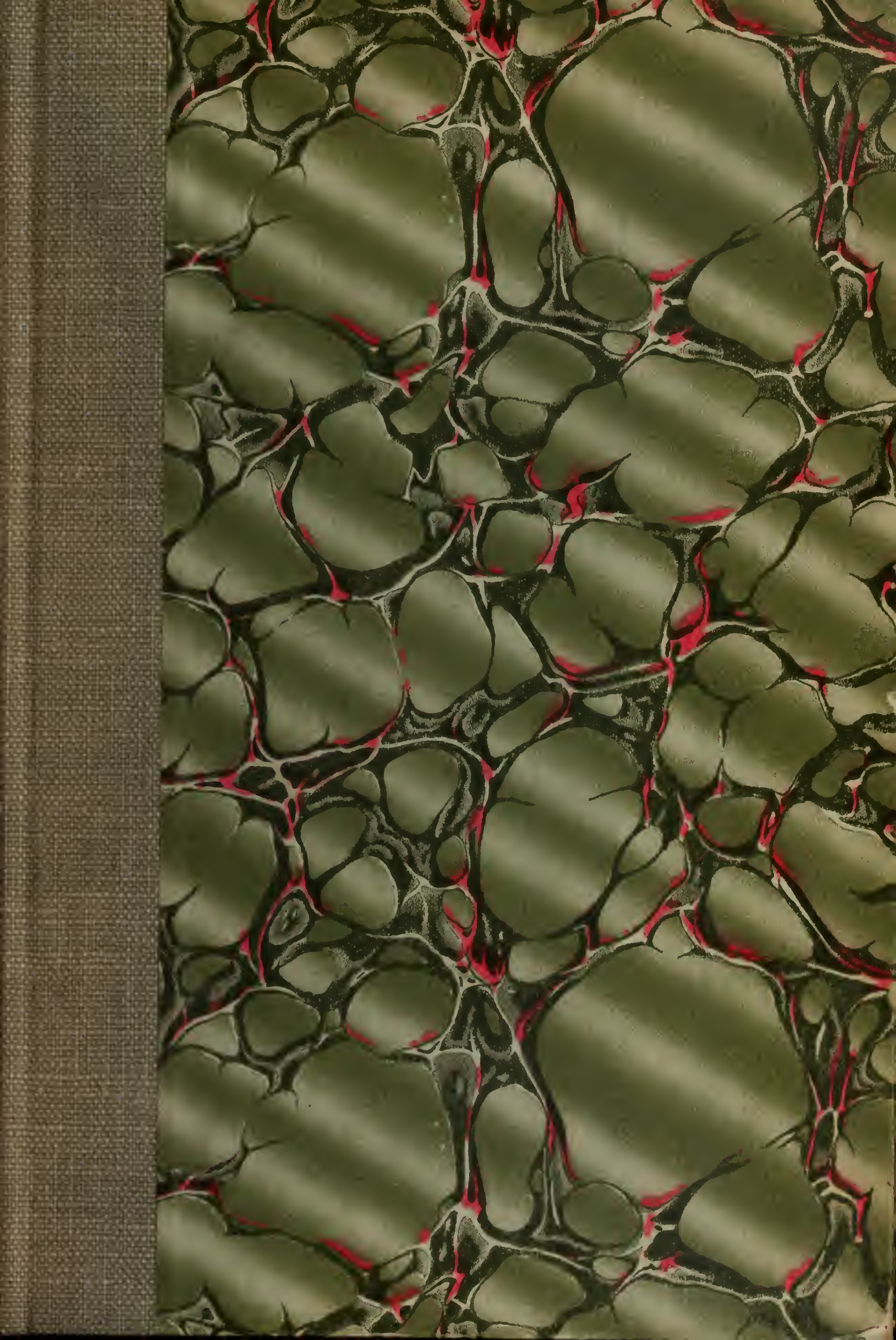

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THE

ODONTOGRAPHIC JOURNAL,

2806

CONDUCTED BY

J. EDW. LINE, D. D. S., M. D. S.

VOLUME XVI.

APRIL, JULY, OCTOBER, 1895 AND JANUARY, 1896.

ROCHESTER, N. Y.:
ROCHESTER DENTAL MANUFACTURING CO., PUBLISHERS.
1895—96.

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THE
ODONTOGRAPHIC JOURNAL

VOL. XVI. April, 1895. No. 1.

THE SHEDDING OF THE DECIDUOUS TEETH A PHYSIOLOGICAL PROCESS.

We have no hesitancy in stating that the process of shedding the temporary teeth is a purely physiological one; though it has been suggested by some writers of later date than those referred to, that inflammation in a more or less marked degree, is present during the accomplishment of this work. This we cannot accept as yet proven; and may state that in a great majority of cases there is no indication whatever of inflammation, or even special irritation. It is true that oftentime local disease of more or less marked character is concurrent with shedding the teeth; but that it occurs as a necessary result of the removal of the roots of the temporary teeth, we think. there is no evidence.

In the plan of the human organism the temporary teeth are to be displaced to make way for the permanent; and it would seem to be unreasonable that diseased action, even in the mildest form, should be called in to aid in the accomplishment of this work. Disease never occurs without some violation of physiological law.

Again, it is admitted by all intelligent observers that this work is accomplished by the solution of the material to be removed; and this cannot be accomplished without the intervention of a solvent. The debris from the wasting structure is absorbed and carried away through the proper eliminating channels. In order to be absorbed, and thus disposed of, the material operated upon must be in absolute solution.

Third, the fact that is clearly shown by intelligent observation is, that both the organic and inorganic constituents of the cement and dentine are simultaneously removed. An examination of the wasting surface does not present a softened condition, as is shown in decay of the teeth, and as would be shown here if the inorganic material was first removed; nor is there a chalky condition of the wasting surface, as would be shown if the organic constituents were first removed.

We are, therefore, forced to the conclusion thst the agent concerned in the removal is one having an equal action, so far as its solvent power is concerned, upon both the organic and inorganic constituents.

There are certain uniform features in the accomplishment of this process that indicates quite clearly the fact that it is governed by true physiological law. This is shown by its operation at about a uniformly given time, and by its operation upon certain pairs of teeth.

This manifest law rules out inflammation, or any diseased action as a necessary factor in the process.

The removal of the roots of the temporary teeth has definite periods for its accomplishment; which is always carried out according to the plan, when there is no diseased or abnormal condition present. Neither inflammation nor disease of any kind is uniform in its attack or mode of operation.

The removal of the roots of these teeth is accomplished in nearly all cases without any indication of disease, either in appearance or sensibility. Hence the conclusion is well nigh forced upon us, that the removal of the roots of the temporary teeth is by a purely physiological law; and that disease in none of its manifestations is a factor, even in the slightest degree, in its accomplishment.

A fourth point, recognized by all close observers, is that the surface of the root being acted on is always in opposition to the correspoding and approaching permanent teeth.

Fifth, there is always found an intervening soft, highly vascular tissue between the permanent crown and the temporary root during the time of the removal of the latter.

Sixth, these hard surfaces are never found in contact when in a normal condition.

Seventh, the root of the temporary tooth is not removed when the crown of the permanent is absent, or its growth arrested, or is situated at considerable distance from the root.

Eighth, the root is not removed by this absorbing process, in the absence, from whatever cause, of this intervening vascular body or absorbent organ.

This organ is in some cases, though rare, never developed. In other cases it is destroyed by disease. In either case the root is not absorbed; and this even though the permanent tooth may grow and be erupted, when usually the permanent tooth is made to take a wrong position.—TAFT (J.), *Ohio Dental Jonrnal.*

CHLOROFORM—HOW TO GIVE IT.

Chloroform may be given as safely as ether, if the following rules are adhered to:

1. The stomach should contain no food, and a very small quantity of liquid.
2. Place the head a little lower than the trunk.
3. Have no tight clothing about the patient.
4. The anæsthetic should be chloroform (Squibb's), 70 per cent. alcohol, 30 per cent, by volume.
5. A hypodermic of morphine sulph. gr. $\frac{1}{4}$, and atropia sulph. gr. $\frac{1}{150}$, should be given a half hour before administering the chloroform.
6. The first inhalation of the vapor should be well diluted with air, and very gradually given.
7. A teaspoonful of aromatic spirits of ammonia should be given in a half ounce of whiskey or brandy by the stomach.
8. A starched towel folded in the shape of a cone, the apex open, should be used in administering the chloroform; this allows the air to enter freely.
9. The pulse and reflex of the eye should be closely watched, and the towel cone removed from time to time when indicated.

The physiological and therapeutic effects of the drug readily suggest the reason for these precautions, hence I shall not enter into a discussion upon the subject. I have never had a death from chloroform in an experience of five years.—SPOTSWOOD (D. J.), *International Journal of Surgery.*

DENTISTS AND THE CENSUS OF 1890.

The *American Journal of Dental Science* for March has for its leading article a most readable historical sketch, by Dr. Richard Grady, of the efforts of himself and the "Associated Committees" to keep dentistry in line with the so-called liberal professions. Dr. Grady refers to the matter as follows:

January, 1881, this Journal published the correspondence between Dr. T. B. Gunning and the Census Bureau, which in 1880 demanded statistics on the ground that dental offices are establishments of productive industry. A similar unwarranted demand for statistics of manufacture was made of dental practitioners in 1890. While as early as January 3, 1881, Gen. Francis A. Walker, Superintendent of the Census of 1880, determined to omit from the tabulation, "Dentistry in all its branches," it was not till June 27, 1892, that

Supt. R. B. Porter of the Census of 1890 agreed in writing "with the representatives of the Dental Association present at a meeting of the Committee on the Census to carry out the spirit and purposes" of an amendment to a Bill, which had passed the House of Representatives, providing penalties for refusal to answer questions included in the schedule of the Census office, that nothing in the Act "shall be construed as authority to collect statistics from professional men such as lawyers, physicians and dentists." With a similar experience, it will be 1904 before the dental profession will have adjusted the case with the Census bureau of 1900!

The American Dental Association has appointed a committee consisting of Drs. Alonzo Boice, Wm. Shaw Twilley, C. A Meeker, to draft "A sketch of the history of dentists being classified as manufacturers by the Census Bureau of 1890," and the letter published elsewhere in this Journal by one of the editors was prepared at the special request of the chairman, Dr. Boice. So far as known, no other documentary evidence has been published, except the correspondence in the "Annals" of the Philadelphia County Dental Society, after October 20, 1890, and the report of Dr. J. B. Rich, chairman, in the "Transactions" of the American Dental Association for 1892.

What the profession understands by a *mechanical* dentist is well expressed in a case presented to the National Association of Dental Examiners at its meeting in 1884, by Dr. E. P. Keech, President, from Maryland: "The party is a first-class mechanical workman; he has no sign, and the speaker was not sure that he had ever filled a tooth; he works in a laboratory, doing that class of work; his business was to make a pivot-tooth, or a set of teeth—whatever may be given him to do." The Census office, however, had these views: (1) September, 1890, "Referring to mechanical dentists you are informed that the term is considered by this office to embrace all branches of the profession except the extraction of teeth and should be duly reported on Schedule No. 3." (2) October, 1890, "The term "mechanical dentistry" is intended to mean that branch of the profession which includes the manufacture of artificial dentures, such as plates, crowns, caps, etc., which are manufaetured wholly or in part outside the mouth, and afterwards inserted." (3) Regarding the production of artists in the dental trade" * * * * * "These men are certainly manufacturers in the same sense that a blacksmith who makes a shoe from a bar of iron and fits it to the horse's hoof is a manufacturer."

A fit conclusion is the query in an editorial in the Philadelphia

Press on the classification of dentists, "why the repair of teeth should come under mechanical employment and the repair of the body belong to a liberal profession."—Editorial, *American Journal of Dentai Science.*

THE INSTITUTE OF DENTAL TECHNOLOGY.

Technical education is in the air, and our men of "light and leading" in and out of parliament have for some years past been trying to supply what has long been felt as a real and pressing want. The English artisan has been told that his productions were inferior to those of his brethren on the continent, and the cause of this inferiority has been generally attributed to a want of "technical" education. In all directions we see efforts, however spasmodic, being made to remedy this state of things, and much credit is due for what has been done by the City Guilds, the Polytechnics, and other bodies throughout the country. The old-fashioned idea of curing all our mechanical ills by doses of dry lectures has been found to be a delusion, and experience has shown that science must be taken into the workshop as well as physical strength to ensure the proper training of a youth in any industry.

In no calling has this want of proper training been felt more than in the mechanical department of the dental profession. It is notorious that a very large number of men who practice as dentists have little qualification to practice, far less to teach this important branch, while many of those who have the requisite ability have not the time. Busy practitioners know very well that when they take a pupil or apprentice they cannot possibly give him the help and education which they ought to do, and that his education will mainly consist of what he can pick up from the laboratory assistant. The deficiency in mechanical training of pupils on coming to the schools of dental surgery and the impossibility of obtaining adequate mechanical help are accepted facts, if we may judge from the papers which have been written and the subsequent discussions in dental societies for the past ten years. If talk could have produced the necessary reform, then it were already done. Action is what is wanted and it is a stigma upon the profession that it has waited until 1895 to see steps taken to remedy this grievous state of affairs. However, we have left the bad old past behind, and we enter upon a new and brighter era, and this is due to the endeavours of Dr. Cunningham, the Principal of the Institute of Dental Technology, who has spared neither time nor money to further the interests of the dental profession, of which he is a distinguished ornament. This institute, which is situate at 4, Langham Chambers, London, W., is unique of its kind, and from a recent visit and chat with the Principal we feel sure it will do much to elevate the profession of dentistry. All that practical knowledge can suggest has been done to make the institute complete. The pupils will pass from the lowest rung of the ladder to the highest point of scientific skill, and all the latest methods and appliances will be shown and used ; and last, but not least, the leading men in mechanical and scientific dentistry will be engaged as instructors.

THE NEW INSTITUTE

is specially suited for the purposes to which it is now being put. The rooms are lofty, well ventilated, and well lighted, and when we add that the appliances have been selected by such an authority as Mr. W. Lombardi, the well-known mechanical dentist to the profession, it will at once be seen that everything is up to date. Nearly all methods of manipulation will be shown, so that the students will be able to see by comparison those which are best for particular kinds of work. This, of course, applies to the mechanical portion of the tuition.

THE MANUAL TRAINING ROOM

occupies a portion of the ground floor, and it is here the pupils will take their first lessons in wood and metal work. The room is fitted with lathes of the most approved pattern—the "Pittler" being one of them—benches, tools, blowpipe arrangement and anvil for small forgings, vices, and a modern grindstone, carving tools, etc. Here the pupil will get a thorough grounding in mechanics, and care will be taken to make him something of an artist as well, for there will be modelling in clay, wax, and gesso work, as well as wood-carving and repousse work, taught by special instructors from the famous Guild and School of Handicraft. This department will be under the superintendence of a special instructor—*not* a dentist—Mr. Massey, a gentleman who has occupied a high position in one of our leading firms of scientific instument makers. In connection with this room, there is an annex in the basement, equipped with an anvil and forge, where the students will have an opportunity of working on heavier forgings. This portion of the institute is replete with everything which skill can devise and thought suggest. There is a place for everything, and students will be taught the necessity of seeing that everything is in its place. In short, it is a model workshop.

In the basement to which we have referred, there is a dark-room for photographic purposes, for preparing slides for teaching, and the annex will also be used for the study of practical metallurgy. Here the students will make their own moulds, make their own compositions and alloys, roll their plate and draw their wire, and the appliances embrace everything from a flattening mill to a sand-casting bench.

THE SCIENCE ROOM

will be devoted to the scientific aspect of mechanical dentistry, and here the principles of chemistry and physics will be taught, and experiments made to show their practical bearing on dentistry. The laboratory method of teaching thus reinforced by exercises of a practical nature, often with apparatus the students will themselves have made in the manual training department, must yield excellent results. As far as possible, a student will be made to understand everything from the composition of a plate to an alloy, a solder to cement filling, the effects of rolling and milling, and at the same time understand all the mechanical principles underlying the different processes. After the student gets a sound idea of physics and chemistry as applied to dentistry, then comes the course of practical metallurgy, and this department has been entrusted to one of the best and most experienced of teachers, Dr. Lapraik.

LABORATORY OF MECHANICAL DENTISTRY.

This is the principal room of the building, being spacious, lofty, and exceedingly well lighted. Benches are fitted up all round, while there is an electric light for each student, and beneath his hand is a nest of drawers, all carefully fitted to hold everything he may require in the shape of special tools to facilitate rapid work. In addition there is an "easel" back, upon which are seen other tools which may from time to time be required. The gas jets are so arranged that they can be used for other purposes than light—for instance, the blow-pipe can be instantly used for soldering, &c. It is here sought to show the comparative merits of different methods of gas appliances. In the centre of the room is a horse-shoe bench, for demonstration purposes, at which the students will work standing, while the other sides of the room show lathes of the latest pattern. The lathe heads have been specially designed by Mr. Lombardi for this institute, with 24-inch driving-wheels, for the polishing, and 21-inch wheels for the grinding lathes. This, it will be seen, is a distinct advantage over the ordinary method.

The plaster bench is of quite a new design. The zinc-lined drawers are always partially open, so that all falling plaster is caught. In front of the operators is the receptacle for the plaster, and this is so constructed that it is impossible for the plaster to get damp, as it is never exposed to the air.

In this room, too, is the vulcanising bench (Wirth's patent vulcanizer being conspicuous), provision being made for eight burners ; but this, of course, can be used for other heating purposes. To secure the comfort and health of the students, there is a hood overhead so as to secure a prompt extraction of all objectionable vapours. The bench is of copper, and the latest forms of vulcanisers will be adopted.

There is still another bench, copper faced, with hood over, for soldering purposes and for fine work, such as continuous gum work. Here is not only the ordinary blower, but compound air or oxygen blow-pipe. From the side of the room there is a wall-socket, so that the electric light (which, by the bye, illuminates the whole building) will be available for lantern projection on the opposite wall.

THE PRINCIPAL'S ROOM.

This will contain a small technical library for the use of students, and it is in this room that there will be an operating chair for demonstrations showing the application of appliances to the mouth. In addition, there will be a museum of plaster models, and typical specimens of dental appliances, old and new, from the bone age to that of what we may fitly term the modern dental engineer.

For the present, at least, until the institute has its full quota of curriculum students, the advantages of the institute are available to practitioners, or their pupils, who may desire to obtain special instruction in any particular branch of mechanical dentistry, or for research work, and as only the most experienced instructors are engaged and the appliances for use are most complete, it offers unrivalled advantages. There is no institution like it in this country or on the continent, and even Haskell's school in Chicago falls far short of the all-embracing opportunities of the Institute of Dental Technology. It deserves success, and it does not require a great prophet to foretell that it will get it.—*The Dental Weekly.*

PULP DEVITALIZATION AGAIN.

The following formula has proven the best of a number experimented with :

Arsenious acid	gr. xx.
Hydrochlorate of cocaine	gr. xxv.
Lanolin, q. s. paste.	

Keep this preparation in a large open-mouth vessel.

Successful devitalization has invariably followed the application of the above preparation to a pulp. In a few cases a second application was necessary; this can be accounted for by the presence of inflammation. Too much emphasis cannot be used in cautioning the operator to first see that the pulp is relieved of as much of the inflammation present as possible. This may be done in the following manner: The pulp having first been doomed to destruction, the operator should place the dam in position. This is essential. It is better, the tooth having a proximal cavity, to cover the tooth opposite the cavity. Proceed to disinfect and dry the teeth and cavity or cavities. This may be done by washing the parts with an alkaline solution, afterward washing with oil of cassia water, and dry. If the pulp has given a great amount of pain, and simple anodynes will not relieve the congestion, apply cocaine, 20 per cent., until obtunded, then with a sharp pointed broach, puncture it. Very little pain, if any, will accompany this operation if time is taken to allow the cocaine to act. Carefully wash out the cavity with a little cassia, or cinnamon water, afterward with peroxide of hydrogen, and dry. To stop the oozing, after having dried it as well as possible, apply a pledget of cotton saturated with carbolic acid. This will form a slight film over the puncture, thus preventing oozing.

Now is the time to apply an anodyne. My usual procedure would be to place a pledget of cotton saturated with eugenic acid over the pulp, and a larger pledget of cotton over this, covering the whole with softened gutta-percha. It is essential to success to follow some regular rule in allaying inflammation previous to the application of arsenic. In some cases the above treatment must be repeated, but very seldom more than twice will be necessary. After having reduced the inflammation as much as possible, proceed to devitalize. Adjust the dam, wash the tooth or teeth with an alkaline solution in order that all grease, etc., may be removed. With a mild antiseptic wash out cavity, and dry. In the application of arsenic care must be taken with regard to placing the medicament. As a rule, a small instrument capable of being shaped to fit different cavities, may be made from an excavator. With this instrument take up a portion of the preparation the size of a No. 3 bur, and place over the pulp. If possible, secure an exposure before placing in the devitalizing agent. Then cover this with a piece of bibulous paper folded several times, and cut to just cover the arsenical paste. Mix cement just thick enough to run into the cavity without pressure, and seal with a thin layer of it. Cement, if allowed to run over the dressing, will not disturb it in any way. If the operator does not think a film of cement is sufficient to prevent absorption of moisture, a stopping of gutta-percha may be placed over the hardened cement. It is very essential that no pressure be exerted on the pulp dressing for two reasons: First, the pressure would be liable to force the application onto the soft tissues of the mouth; second, it would set up an irritation. The application must reman at least twenty-four hours; from that to seventy-two hours in adults.

Arsenic should not be used as a devitalizing agent in temporary teeth. The frequent application of carbolic acid, covered with proper stoppings will do the work in time.

Much abuse of the use of arsenic is made in our dental colleges. While not commenting on the teachings of the learned gentlemen presiding over the chairs in various dental institutions, it would still be wise for them to have demonstrators attend at the first application and removal of the arsenical paste by the student. One of many incidents which presented itself, while in college, was the way a student expressed himself on the application of "eccentric" as it was called in our school of learning. He said the application was made without the dam having been adjusted, and when the patient returned the stopping was removed, and contents of tooth washed into the mouth by a stream of warm water. Since then he has learned from teachings and experience that necrosis from arsenic is not as easy to treat as it might be. Many would say this would be impossible after the careful instructions listened to in the technical laboratory, but nevertheless, it is a fact. Students are overanxious to show their ability and pride, and the humiliation of being confronted by their errors before their first patient, often force them to desperate means, instead of seeking the willing aid of an ever-dependent demonstrator.

Cocaine, 20 per cent. solution, injected according to the method of Dr. Manning A. Birge, of Grand Rapids, Michigan, on which subject he read an admirable paper before the Grand Rapids Dental Society, April 10, 1894, has its merits and demerits, when compared with arsenic. While my experience has been limited in the use of cocaine for this purpose, it may be well to state that pleasing results have followed its application. Some time since, a central incisor was operated on by this method, the root being filled immediately, with no inflammation resulting from the apparent abuse of therapeutic principles, that is, the placing of a foreign body next to the lacerated end of the pulp tissue. This is but one of many cases.

Do not construe me as an advocate of immediate root filling by the foregoing remarks, as the operation was an experiment, not an everyday practice in my office. It would be advisable to put a mild antiseptic dressing into the canals after using this method; in this way taking the minimum number of chances for failure.

Much hemorrhage accompanies the extirpation by this method, but by frequent washings, as recommended by Dr. Birge, this may be checked in a short time.

As a substitute for arsenic, cocaine will yet rank number one for pulp devitalization. In small tortuous canals, difficulty will be experienced in forcing the cocaine into the canals; but how much better, gentlemen, in such cases will it be to remove the bulbous portion of the pulp under this grand anæsthetic, leaving the small fibers alive and healthy, ready to assume the function of nourishing the tooth, instead of devitalizing by arsenic and leaving the dead to take care of itself, which would be mere folly to assume.—JOHNSON (A. G.), *Dental Review*.

ANESTHESIA AS A DENTAL DISCOVERY.

I have been impressed to-night with the story with which you are all familiar, or were familiar in your early childhood, — the story of the *Ugly Duckling* by Hans Christian Andersen. You remember that this ugly duckling came out of his shell late; he was picked at, was persecuted, and loved by no one, and the only talent he had was that he was able to swim. As he passed on through life he happened upon a tribe of wild ducks, and the leader of the ducks said to him, "You are very ugly, but you can swim and you can fly, and I think I will adopt you into our tribe; but you must remember you are never to marry into our family,"—and eventually the duckling became a beautiful swan.

Now, it seems to me that dentistry possesses, in its relations to the professions, very similar characteristics to that ugly duckling. It was born late. It began its life in the middle of the last century, and has been growing and building its own centers of instruction, laying its foundations in therapeutics and pathology, and upon experience creating a profession worthy the name. Standing here this evening before this august assembly, I feel that the representation from fourteen states gathered here to do honor to one of our number indicates a professional spirit that rejoices my heart.

When Horace Wells, in Hartford, in 1844, discovered the properties of anesthesia, unnamed at the time, did he confine it to his own selfish purposes? It was a transition period in dentistry. Every professional man's hand was against every other man's. Horace Wells was broader than those with whom he came in contact. He desired to give the benefit of his knowledge to that "greater world," as Goethe loved to call it. He believed it was capable of being used in major surgery, and did all that was possible to arouse interest among medical practitioners. He went to that great center of medical instruction, Boston, and gave an exhibition before the medical faculty and students, and was hissed from their presence. This action will ever remain to the discredit of the medical profession in Boston.

But Boston is not alone in this; for every age has stoned its prophets, and will probably continue to do this to the end of time. Dr. B. W. Richardson, of England, has in these latter days, and indeed in the past few weeks, in *Longman's Magazine*, undertaken to tear the mantle from Horace Wells's shoulders and place it upon those of Sir Humphrey Davy. It has been a long period to wait to perform an act of this character; ninety-four years since Humphry Davy undertook to promote the discovery of Priestly.

It is pertinent just here to consider what constitutes a discovery. It is certainly true that very few new things are born into the world through the unaided efforts of a single individual. The inspirations, apparently floating through the mental ether of the world, drop here and there as in the parable, some on rocky, some on poor, and some on fruitful soil. That falling on rocky soil dies in its birth, that on poor soil fails to produce but a weakling, but the third brings forth fruit worthy of the generation. It fell upon Priestly, and there was no germination; on Sir Humphry Davy, and it ended in a dream; on Horace Wells, and the result was for the comfort and healing of the nations.

Has this introduction of anesthesia been of any real benefit to dentistry? I might say almost nothing. To be sure, in the earlier "duckling" age of this profession, the extraction of teeth was the principal business of the operator; but to-day dentistry has grown far beyond that. We might now follow the old Delphian idea and hang up in our temples—in our operating-rooms and offices—the leaden forceps indicative that no tooth should be drawn until it could be extracted by such an instrument.

When Dr. Richardson wrote the article alluded to, he very vividly described the condition of surgery just prior to the introduction of anesthesia. He recalls the feelings of the surgeon, with all the care and anxiety of the day before him; the horror of the students, and the cries of the patients. Is it any wonder that there was intense excitement when the surgeon entered the class-room and announced that there would be no lecture that day, "that he had a piece of news to communicate—nothing less than the discovery of a method by which the most important surgical operation could be performed while the patient was asleep!" The news had come from Massachusetts Hospital. It is not surprising that the students followed the surgeon to the amphitheater to see this wonderful operation. Was there one in that excited audience who thought of Sir Humphry Davy? No, he was entirely forgotten.

When we contemplate the past history of the world, the horrors of the battle-fields, the terrors of the hospitals, and the accidents of life, the mind falters in its attempt to grasp the aggregate of human misery. Who can translate this into words suitable for moden comprehension? This wail of the ages was voiced in the Garden of Gethsemane, when the Great Master of human thought, in anticipation of the cruel agonies of the cross, lifted up his voice and prayed, "Father, let this cup pass from me!" Eighteen centuries passed into oblivion with no response; but near high noon of the nineteenth, in the new world of Columbus, in a humble home in Hartford, there arose a "still, small voice" sounding above this wilderness of suffering. It was wafted over the deep waters, echoed and re-echoed in joyous acclaim throughout the world: "Lo, the cry of agony from the surgeon's knife is silenced forever."

We cannot deify thee, as the ancient Greeks would have done, but we give thee most hearty thanks, and in our heart of hearts we enshrine thee, O Anesthesia, goddess of our modern civilization! though not the first-born, the loveliest of all the children of discovery in this our nineteenth century!—TRUMAN (J.), *Dental Cosmos.*

OPHTHALMIA IN A SCHOOL.

Epidemics of ophthalmia have been observed in English schools frequented by children of the poor and the laboring classes.

But this is the first report of such an epidemic occurring in an institute well known in England as one where the hygienic conditions are of the best and the social position of the scholars leaves nothing to desire. The form of the disease was a benign follicular conjunctivitis. The first cases were sporadic, and gave no trace of the origin of the invasion. Teachers, as well as the scholars, were sufferers.

The follicles were found almost exclusively on the lower lid, rarely extending into the cul-de-sac. The upper lids were very rarely attacked. When this did happen the epithelial covering appeared roughened, as though scratched or covered with fine dust.

Of 102 persons connected with the school, examined at different times, 13 only remained exempt. The servants who were employed in the dormitories were attacked, while those employed in the kitchen were not. Everything indicated that the infectious agent was localized in the dormitories.

The author proposed that the scholars should be sent back to their families. Those affected with ophthalmia should take a certificate stating the condition of their eyes, and that they should not be admitted into any educational institution before their complete recovery. Mr. Jonathan Hutchinson, who was also consulted, was of a different opinion, fearing that the scholars would become centres of infection in their new surroundings. This view was adopted by the committee. Necessary measures were taken to isolate the patients in a house rented for this purpose and situated on the sea-shore. The best results were obtained, but recovery was very slow. In spite of every attention, the disease continued for several months.

This epidemic presents several interesting points in the pathology of follicular conjunctivitis. All the cases recovered with no trace of a scar. No case degenerated into trachoma. More than half of the pupils affected were withdrawn from the school during the Christmas vacation (the epidemic had broken out in August) while the ophthalmia was still in progress. The author had the opportunity of following up many of the cases, and can affirm that not one of them communicated the disease to others. The most rigorous measures to remove the contagion from the institute itself were ineffectual. It seemed that the infectious agent came from the walls of the building, and that contagion played no part in the propagation of the disease.—SULZER, *Annales D'Oculistique.*

FOLLOWING BROPHY'S OPERATION FOR THE REMOVAL OF THE INFERIOR DENTAL NERVE

Dr. Nelson: I would like to ask Dr. Brophy how about the sensitiveness of the teeth; how have the nerves behaved in the teeth.

Dr. Brophy: That brings up a question as to the source of the nerve supply to the teeth. Some years ago, quite a good many years ago, Dr. Allport made a statement in this society that he had exposed the end of a root of a tooth in the removal of some necrosed bone, and was able to pass an instrument beneath the root, and subsequently, after the cavity was filled with new tissue, the tooth was sensitive and contained a living pulp. At that time I was very skeptical about this, and thought he made a mistake, but experiences of my own, following, have convinced me beyond any doubt, that there is not a nerve or branch of the inferior dental nerve which passes to the apex of each root. In a case of my own, an extensive necrosis of the lower jaw, which I treated something like eight years ago, I found all the teeth, anterior to the second bicuspids, loose, and I supported them by taking an impression in moulding compound, made a metallic die and counterdie, swaged a platinum plate or splint so it would fit the loose anterior teeth as well as the molars that were firm, and cemented it to all the lower teeth, including the molars and incisors. After thus securing the teeth I removed all the necrosed bone down below the ends of the roots, which were still covered with membrane ; I could pass an instrument and carry it not only beneath, but beyond them. I believed that in the course of time it would be necessary to open each one of these teeth and remove the dead pulp. About eighteen months after I made this operation, I took off the splint, which had served its purpose well. To my surprise, I found that the teeth were sensitive. Their color was bright and their pulps were living. These teeth, I can tell you, gentlemen, to answer Dr. Nelson's question, are sensitive, and I think they are going to remain alive unless something else effects their destruction.

Dr. Cattell : Dr. Brophy has suggested something, so that I feel like asking him a question. I would like to have this progress manifested, as I do not think it right to have all our old ideas and theories taken away entirely without something tangible in place of them. If he can give us any theory or idea as to where these teeth he was talking about got their nourishment from ; if after an exposure of one-third of the root and passing instruments all around them, they were still sensitive, I would like to know where they got their nourishment from.

Dr. Brophy : I believe that the nutrition of the teeth is dependent upon the tissues of the nerves that surrounds them. In other words, that it comes from the subjacent tissue. How it is done is a question I have not studied, but I am satisfied that it comes from that source. I am satisfied that if you were to take off all the membrane, you would destroy the pulp, and I think the nutrition would be lost. I have no doubt Dr. Black could tell us something about this. These facts stand right up before you and you cannot down them, and if you have any doubt about that man's teeth being sensitive I will show you the nerve taken from his jaw. If you want to know, there is a chance to make an investigation. You will find out that there is an inferior dental nerve. I know Dr. Black is engaged in the study of this question a good deal ; but these facts are there, and it will take a lot of theory to set them aside.

Dr. Black: I have given this subject some attention. I have made the sections of a good many teeth after injection so that the blood vessels could be readily followed, and I may say that I do not know of any reason why the pulps of the teeth should die from the removal of the contents of the inferior dental canal. The collateral circulation is so very abundant through the Haversion canals freely from the alveolus to the periosteum, or from the peridental membrane to the periosteum, that cutting off the blood supply passing through the bone or this canal, certainly would not rob the teeth of blood; indeed, you may cut off the blood supply from the apex of the root, and then cut off the blood supply under and over the rim of the alveolus, and you have not injured materially the blood supply. Now, so far as the peridental membrane is concerned, you have not injured its sense of pain or its sense of touch, by cutting off the nerve supply that comes into the peridental membrane and into the dentine of the root over the margin of this alveolus. This blood supply seems to be very abundant, and so long as this blood supply may reach the apex of the root, certainly the pulp may live and be sensitive, and will not die on account of the removal of the contents of the canal.

In one case where the contents of the canal were removed a short time ago, I found anæsthesia over a small portion of the lower lip. I do not expect the pulp of this tooth to die. I do not see any reason why. In regard to the subject of blood vessels or contents of the inferior dental canal, well if any of you will examine a well injected specimen of the vessels of this region, the peridental membrane and periosteum, you will see you have no use for a branch at all, the collateral circulation is abundant.

Dr. A. W. Harlan: I have one thought further to offer on this question in support of the theory that Dr. Brophy has advanced, and that is this: If the teeth were dependent for their vitality on the presence of the inferior dental nerve in the inferior dental canal, we would have found long since that operations that have been made at the entrance of the inferior dental canal and on the inferior dental nerve for the severing of the nerve at that point would have demonstrated that the teeth would have died; and that this operation, which is a much more sensible and better operation altogether than the other, should be more fatal to the sensitiveness of the teeth cannot be thought of for a moment. You can sever the nerve at the entrance of the canal, and cut off one, two or three inches, and still the pulp lives, from the collateral circulation. I think this is a very beautiful operation. I have never had an opportunity to perform it, but the very first opportunity I have I shall try it, and I believe it is the coming operation of that kind.

Dr. Brophy : I have nothing more to say except this, hat I was very glad to hear Dr. Black's remarks on the subject. I have mentioned this matter to some of my friends and they have doubted my conclusions ; but I feel that the facts I have stated are based on clinical experience, and my observations have not been by any means limited to a few cases. I find that anatomical preparations are misleading ; they are not correct ; they do not impart to the mind of the student the true idea. There is a theory that each inferior tooth root receives a nerve branch direct from the inferior dental nerve, and that the removal of this nerve will remove also the source of nerve supply to the corresponding lower teeth. It is a beautiful theory, but there is no truth in it.—*Dental Review.*

HYDROGEN DIOXIDE AS FURNISHED TO PRACTISING DENTISTS.

Hydrogen dioxide solution should be a clear fluid, containing sufficient amount of the dioxide to give ten volumes of oxygen when completely decomposed. Fifty cubic centimetres of it should not require more than about five cubic centimetres of decinormal sodium hydroxide to neutralize the acid present. It should keep well in a moderately cool atmosphere. On opening a fresh sample no distinct explosion should occur, and when poured into a beaker very little effervescence should be noted.

The assay for volume strength is made by means of a solution of potassium permanganate. I need not describe it here.

I give the following figures as to hydrogen dioxide solution sold to dentists (Philadelphia).

TESTS ABOUT FEBRUARY 16, 1894.	Volumes.
Prescription from A. Robbins' drug store, Eleventh and Race Streets	10.9
Prescription from drug store at Frankford and Girard Ave.	10.9
One-ounce bottle, S. S. White Dental Manufacturing Co.	5.1
One-ounce bottle, S. S. White Dental Manufacturing Company, second sample	5.4
One-ounce bottle, G. Sibley	0.5
One-ounce bottle, H. D. Justi	1.4

RECENT TESTS.	Volumes.
One-ounce bottle, S. S. White Dental Company, first sample, November 10	5.04

One-ounce bottle, S. S. White Dental Company, second sample, October 30	5.3
One-ounce bottle, H. D. Justi, first sample, November 10	.56
One-ounce bottle, H. D. Justi, second sample, November 10	.56
Sample of Marchand's, purchased at G. Sibley's, October 30	12.04
Samples of McKesson & Robbins's hydrozone, at least six months old, kept in photographic dark room, and opened to-day, November 10, no internal pressure, contains	9.1
Samples of McKesson & Robbins' pyrozone that has been standing in laboratory for at least six months, opened occasionally, showed	9.1
Pyrozone, when fresh, contains almost exactly	10.

I have tested also the acidity of the small samples noted above. They show a rather high acidity in some cases, but as the quantity available for test was small, it is hardly just to institute comparisons.

The above samples were all in original packages, and were tested when fresh. The one-ounce bottles cost fifteen cents,—a very high price even for a good article. Pyrozone, which is most expensive, ten-volume solution, in this market sells for fifty cents for four ounces, but the above samples are sold at the rate of sixty cents for four ounces. A ten-volume solution of excellent keeping quality is made by the Oakland Chemical Company, and may be obtained at retail at about sixty cents a pint. Such a solution will keep in an office for weeks without appreciable loss if a little care be taken not to place it in a warm corner.

There is no necessity for buying the material in one-ounce bottles, and there is also no reason that the large supply houses should retail such inferior samples as above noted. Approximate assays are easily made at such establishments. A solution of potassium permanganate will last a long while, and but one cubic centimetre of a given sample of hydrogen dioxide is required for the test. Even, however, if this be thought too much trouble for the dealer, he can purchase guaranteed articles and retail them.—LEFFMAN, (H.), *International Dental Journal.*

A DEATH DURING NITROUS OXIDE NARCOSIS.

Deaths during the administration of nitrous oxide are rare. So rare, that if we wish to express the proportion of deaths to administrations in the form of a vulgar fraction, we must take for our denominator not thousands, nor even tens of thousands, but millions. Speaking without the book, we believe that a death has never occurred when gas has been given by a skillful anæsthetist; but, though it is thus possible for a man to, as it were, live in the very midst of it, and go through life without seeing a death, yet there is a possibility. It is this possibility which, ever present in the mind of the wise man, quickens his feeling of responsibility, and so is directly concerned in his uniformly good results. It is the forgetfulness or ignorance of the possibility of accident that leads another to neglect to take wise precautions, with now and again a lamentable result. Such an untoward result it is our painful duty to record this month, and as we do so, the fact suggests itself that it comes as a ghastly commentary on our remarks on "Failures" in the last issue. Here is a failure of a serious kind. What can we learn from it: Condemnation of the administrator of the gas? Certainly not! "Let him who is innocent cast the first stone." Rather let us consider the cause that it may help us to avoid a like result in the future.

In Dr. Hewitt's excellent book, "Anæsthetics and their Administration," the dangers connected with the administration of nitrous oxide are conveniently grouped under four headings. 1. The administration of an overdose. 2. The passage of foreign bodies into the larynx or trachea. 3. Respiratory failure occurring independently of the causes referred to in 1 and 2. 4. Circulatory failure: Syncope. Of these the second and third groups are by far the most frequent cause of trouble during nitrous oxide anæsthesia, and are, at the same time, due to causes for the most part preventable. Heart failure as a primary phenomenon is rare, thus Dr. Buxton states: "Whether death from syncope has ever taken place under nitrous oxide is doubtful;" whilst Dr. Hewitt has been "unable to find any reliable account of grave or fatal syncope from imperfect anæsthesia under nitrous oxide." But in weakly and old people with feeble or diseased hearts it must be perfectly obvious that the extra strain coincident to respiratory obstruction may in many cases lead to fatal syncope. But the stoppage of the heart being in these cases secondary to the respiratory trouble, it is evidently possible that, if we can prevent the latter, we may hope not to be troubled by the former.

This case under discussion may be briefly described. The patient was a girl, age twenty-three, who apparently appeared to the administrator to be in perfect health; gas was administered, a tooth was extracted and the patient recovered consciousness (therefore obviously not an overdose), but remained in a listless condition. Shortly, however, she commenced breathing in a spasmodic way, there was lividity around the nostril, and in spite of every aid in about an hour she was dead. Measurement showed her stays to be five inches smaller than her waist, and her internal organs showed that tight lacing had been habitual. In the account to hand, there is much omitted that we should have been glad to learn, but even from this each will see how the respiratory movements must have been impeded by a corset of this description. Unfortunately, as a sequence of events, this case does not stand alone, for it will be remembered that a fatality under similar circumstances happened at Edinburgh, in 1889, the patient being a lady of rank. Here, then, we have two cases of death due in the first instance to respiratory failure, the result of tight-lacing. Surely they teach a lesson. It would seem as if this impediment to respiration escaped notice, yet it is one which should be apparent. We take it that no man would think of administering gas without first examining the mouth to see if there be any actual or potential impediment to respiration therein. He should also be careful to see whether there be any obstruction to the respiratory movements of the thorax, especially tight corsets. It would be a useful rule to always see that these are undone, nor need there be any indelicacy about the matter, especially if the patient be requested to take her seat in the chair, and then be covered over with a large towel or one of the waterproof aprons specially made for this purpose.—Editorial, *Dental Record.*

PHOTOMICROGRAPHY.

Photomicrography was a science of quite recent development, but had already been of immense value in many departments of scientific study. There could be no doubt of its educational value, and no course of lectures was now considered complete that was not illustrated by lantern slides. Photographs were of great value as a check upon observation; they kept drawings within bounds, and did not admit of quite such a play of the imagination as was frequently seen before the days when the camera was called in to assist the microscope. While, however, fully recognizing the value of the photograph in demonstrating the minute structures, he did not think it was able to entirely replace the coloured drawing, but, as a check upon it, it was invaluable, and it was highly desirable that all papers on histological research should be illustrated by both photographs and drawings. There was one point in this connection on which he would lay great stress, and that was that the photograph should not be touched up in any way, either upon the negative or the print. As soon as this was done a suspicion was thrown upon its accuracy, and its value as a check upon observation was completely done away with. Many collateral branches of knowledge bore upon the subject being discussed to-night, the great and rapid advances in the science of bacteriology made during the last ten years have greatly stimulated photomicrography, as the minute organisms with which this new science was concerned were represented by photography with an

CORRECT-COLOR PLATES.

accuracy and clearness not otherwise obtainable. Another important discovery, that of isochromatic or orthochromatic plates, has been an excellent aid to the photomicrographer. These plates gave the correct colour relations of the object in light and shade, and a moment's reflection would enable anyone to see the great value of this in photographing stained preparations. For instance, while formerly a yellow, from its weak effect upon the photographic film, came out black, or nearly so, a properly prepared orthocromatic plate (with the addition of a coloured light screen) renders it light in the resulting print, *i. e.*, in its proper shade relations to the other colours of the spectrum. Blue, again, which to the eye, appears to be a dark colour, is rendered as white upon the photographic plate (blue containing a very large proportion of the chemical rays of the spectrum); a colour-corrected plate reproduces the blue parts of the objects as dark in the resulting print. Another very important factor in the present recent advances in the art was the introduction of the new lenses; first, the water and oil immersion lenses, and

THE ZEISS APOCHROMATICS.

more recently the apochromatic lenses of Zeiss; both these improvements greatly increase the light admitted to the object. As he had described elsewhere, and perhaps might be permitted to repeat here, "the greatest stride in microscopic optics dates from 1886, when the firm of Zeiss, of Jena, introduced the so-called apochromatic lenses. Before the introduction of these lenses, a sharp image in any optical system could only be obtained with one portion of the spectrum, the other portions giving images not absolutely clear, but all more or less blurred. The apochromatic lenses gave an image almost equally sharp with all the colours of the spectrum. In the old achromatic objective the colour correction was only made for one portion of the area of the lens, so that towards the margins, and also at the centre, it was imperfect, but in the apochromatic lenses the colour correction is made equal for all portions of the area of the lens. Again, whereas in the older objectives only two colours of the spectrum were brought to one point, in the apochromatic system all these colours are brought to one point. A special kind of glass in combination with fluorspar is employed in these lenses. The effect of these corrections was practically to abolish colour in the microscopic image ; we obtain an increased concentration of light and a greater range of magnifying power with the same objective, as every high eyepiece can be used with them without detriment to the image. Special eyepieces are used with those lenses called compensating oculars, and their use is rendered necessary by the fact that all lenses of high aperture, owing to their hemispherial fronts, magnify the blue more than the red ; an eyepiece is accordingly used in which the opposite error is introduced, the red being magnified more than the blue, and consequently with these eyepieces the image is free from colour up to the margin of the field." There are many excellent workers in this art, both in

THEY ADVANCED THE ART.

this country and abroad, among the most prominent of the pioneers in this field are Dr. R. L. Maddox, to whom they were indebted for the invaluable suggestion of gelatine as a base for the photographic film ; Dr. Woodward, in America, who produced beautiful results before the introduction of the new lenses ; Dr. Neuhauss, in Germany, whose photographs of flagellated organisms are well known, and in this country Mr. Andrew Pringle, whose beautiful work with high powers was familiar to all : his photographs ot dental caries they had all admired on this screen. The work in this department of their friend and former President, Mr. Charters White, was also well known to them, as also his excellent photographs of dental and other tissues. In taking photographs with low powers of the microscope, no great difficulty came in, provided the specimens chosen were suitable for the purpose ; but the photography of objects such as bacteria, with high powers, was a matter requiring great patience and perseverance, and it was in obtaining good results with a magnifying power of one thousand and over that the utmost refinements of the art were called into play. An expensive and elaborate apparatus

ABOUT APPARATUS.

was not necessary in order to obtain good results. There was no doubt, however, that a special apparatus had many advantages ; such a one as he had there to-night, although not nearly so elaborate as many that were now made, enabled one to do the work with a minimum of fatigue, and ensured rigidity, which was a very important point. The first desideratum was of course a very firm and solid base-board, not supported on legs attached to it, but on a very firm and solid table, and for high power work, wherever possible, on a cemented basement floor, for vibration was the great bugbear of the photographer. The bellows should be capable of considerable extension, and blackened cardboard diaphragms inserted at intervals to cut off all reflected rays ; a small amount of reflection from the interior of the bellows or of the microscope tube would give rise to ghosts in the negative—an unpleasant kind of phantom, which generally managed to blurr the one important part of the negative. To prevent these ghostly reflections, a careful examination of the interior of the camera should be made every now and then, and the slightest reflecting surface should be touched with a dead black point. The microscope tube should be lined with black velvet. Any microscope would serve the purpose that was rigid in the horizontal position, and nose pieces should not be used to carry the lenses, but they should be screwed directly into the microscope body to ensure accurate centreing. A good sub-stage condenser was a very important part of the apparatus, and the high angle achromatic Abbe condenser of Zeiss was one of the best to employ, as it transmitted a very large cone of achromatic light ; it should be furnished with an iris diaphragm. If an oil lamp was used as the radiant, a bull's-eye or similar condenser should be placed immediately in front of the flame, so arranged as to convey parallel rays to the back of the sub-stage condenser. He preferred a large flat wick lamp, with the edge of the flame towards the object, not having had much success with the round wick employed by Dr. Neuhauss. A means of using the fine adjustment while focussing at a distance was of course requisite. In the apparatus shown, this was obtained by a brass rod covered at one part with india-rubber ; this bore upon a friction wheel, and by means of cord and pulleys worked the fine adjustment. There were, of course, many modifications of this focussing apparatus. The portion of the apparatus on which the microscope and lamp were placed was pivoted, so that it could be rotated and the adjustments made while the operator was in a sitting position, before it was returned to its place in front of the camera. For use with the orthochromatic plates coloured glass screens were required—yellow glass of different shades being the most generally useful ; a colour called "signal green" was valuable in photographing certain shades of red. Many preferred to use fluid light filters instead of glass. A solution of picric acid formed an excellent pale yellow filter, and different strengths of a solution of bichromate of potash were useful when darker tints were required. If sunlight or the lime or electric lights were employed, Zetnow's light filter was most valuable. It

LIGHT AND LIGHT-FILTERS.

consisted of dry nitrate of copper two and a-half ounces, dry chromic acid two drachms, water four and a-half ounces. If the lime-light was employed, of course the exposure time was very much shortened, but the eyes must be protected in focussing with dark spectacles or a deep coloured glass placed below the stage. He thought perhaps their purpose would now be better served if he described the steps to be taken in making the adjustments and exposure for photographing an ordinary object—first assuming they were using a low power, such as an inch or half-inch ; and secondly, with a high power, such as a one-twelfth oil immersion, at such an extension as to give a magnifying power of 1,000 diameters. Suppose a good thin and even section of dentine or enamel, unstained, had been chosen. The first thing to do was to sit down to the turn-table, and, having placed the eyepiece in the tube of the microscope, accurately adjust the centre of the flame ; then place the object on the stage and carefully choose the best part of it, seeing that the light was fairly even. Removing the eyepiece return the turn-table to its place, allowing the tube of the microscope to pass within the brass flange on the camera without touching it. A focussing screen carrying a piece of white cardboard should now be placed in the camera, the little door at the side being opened, and again sitting down by the microscope, the projected image is focussed with the coarse adjustment on the cardboard. We now judge if the field on the paper is evenly lighted, and probably find it advisable to adjust the bull's-eye condenser near the flame so as to diffuse the light evenly over the object and its projected range. This method of preliminary rough focussing saves a great deal of unnecessary fatigue in focussing through the screen at the back of the camera, but once having obtained the focus on the card, we close the side door, and put a plate-glass screen in its place ; a very light adjustment with the focussing rod and fine adjustment with a focussing lens will give the true focus of the object. Removing the screen we substitute the filled dark slide, and after closing the shutter of the camera, pull out the slide and all is ready for exposure. Being sure that the apparatus is free from vibration we open the shutter and give the exposure, such an object as this with a good light would require perhaps from ten to fifteen seconds.

HOW IT IS DONE.

HIGH-POWER WORK.

If, however, we wish to photograph a slide of bacteria, and magnify it a thousand times, we shall have to take further precautions, and as such a preparation will have been stained with an aniline dye, colour difficulties will have to be met. To obtain a negative magnified to this extent a one-twelfth oil immersion lens—preferably an apochromatic lens of high angle—should be used in combination with a special projection eyepiece, although of course, by greater extension of the camera, an eyepiece can be dispensed with. Place the substage condenser in position, and with a half-inch lens focus down upon the condenser until the little hole in the centre of the cap is exactly in the middle of the field of the lens, then carefully centre the ærial image of the edge of the flame, which is projected by the lenses of the condenser. Replace the half-inch by the one twelfth and again see that condenser and flame are properly centred, as. although it is much easier to make these adjustments with the lower power, the optical centre of the immersion lens may not quite correspond with it. In photographing a coloured preparation, such as this, almost the full aperature of the condenser should be used, that is, the iris diaphragm should be nearly open to its full extent. Another point is that the angle of aperture of the condenser should be equal to that of the objective if we wish to take full advantage of the latter. The condenser and light being now centred, place the object upon the stage and focus down upon it. This being a coloured object we shall have to employ a coloured screen, and if the stain is methyl violet or gentian violet a pale yellow screen will suit it best. The turn-table is now adjusted, the paper screen placed in position and viewed through the door, a rough readjustment of the focus with the coarse adjustment will be found necessary, and it must be seen that the edges of the disc are quite sharp ; if not, the screw collar on the eyepiece must be shifted and an increased and even illumination obtained by means of the bull's-eye as before. In focussing with the fine adjustment, the glass screen may now be dispensed with, and the focussing glass, which may be either a Ramsden eyepiece or a spectacle lens of eight-inch focus as recommended by Mr. Bousfield, used upon the ærial image in the camera. With a long extension of the camera the rays which form the image being nearly parallel, there is a considerable range in which the focus is quite sharp, and consequently we can dispense with the glass screen. This is often very convenient, as one's eye is not disturbed by any markings upon the surface of the glass. When using a short extension it is necessary to use the glass screen in order to insure that the sharpest focus of the object shall be exactly in the plane of the sensitive plate, because, the rays being more divergent, the region of sharp focus is much more limited in extent. The shutter should now be closed, examined again to make sure the focus has not altered,

TO BRING IT OUT.

and very carefully insert the loaded back, then open the shutter and expose. In this instance, the exposure would be about six minutes, but the time must of course depend upon the nature of the slide and the depth of tint and the coloured screen. High power work involves much disappointment, many negatives turning out failures, and only now and then is a negative secured the qualities of which are thoroughly excellent in every respect. Developing a plate with high power requires considerable experience and judgment. He found he got the best results with pyrogallic acid and soda, and more control of the development. Fresh soda should be added by degrees as the image appeared, always using a small quantity of a ten per cent. solution of bromide in the developer. It often happens that the negative would be clear but undeveloped, in that case it might be intensified. He obtained excellent results with the ordinary mercury and ammonia intensifier. Great care should be used to remove all traces of hyposulphate before placing in the sublimate solution and washing very thoroughly before applying the ammonia. Should the negative be a little veiled it would be better not to try to intensify, but one could very often procure a very satisfactory lantern slide from such a negative by a contact print with a weak light. Many excellent makes of lantern plates were to be had, but he had recently been using the special Ilford and the Imperial plates, developing with hydrokinone, to which should be added a few drops of bromide. To obtain a perfectly clear black ground, which greatly added to the beauty of the slide, he poured on and off two or three times a solution of hydrochloric acid in water, about one part to eight, and then thoroughly washed. He preferred the gelatino-chloride papers on account of the excellent detail they gave, glazing the surface by squeezing on to highly polished ferrotype plates.—MUMMERY (H.)

DISCUSSION.

The President asked if Mr. Mummery had seen the apparatus exhibited at the Royal Institute similar to the one now described, but with a tube at the side reflecting the image. The object was that for instantaneous work or any specimens of a moving description they could watch, bulb in hand, for the instant when the image was in the middle of the screen.

Mr. White said he would be very presumptuous indeed if he attempted to improve upon the excellent paper Mr. Mummery had placed before them. It was so lucid and full of truth that he would recommend every one of his colleagues interested in microscopy to study it. Many of the statements he could endorse from his own practical experience. It was often the practice to flood an object with so much light that nothing could be seen but a glare; this he thought a mistake. If the light was softened the details would come out better. A pale yellow screen was useful to get contrasts, but he had not been so successful with the signal green, which lengthened the exposure without any apparent benefit. The scientific value of the coloured screen was yet in its infancy. He had never worked up to a 1,000 diameters as the vibration from Pickford's vans and similar vehicles in his neighbourhood was not favourable to it.

Dr. Pare asked Mr. Mummery how he used the screen? also if he could say something as to the length of exposure of isochromatic plates?

Mr. Roughton said, speaking from experience, the practice of micrography was rather an expensive business. One might begin with a very simple apparatus, consisting of a box into which the end of the microscope was fixed, and think one was going to do wonders, but gradually it would be found that something better must be got, and accordingly another apparatus would be made, perhaps another microscope bought. Then they would think ordinary lenses would not do, and apochromatic lenses would be substituted. By that time there would not be much left of £100. He would recommend gentlemen going in for photomicrography to make up their minds as to whether they could afford it, or else let it alone. The value of apochromatic lenses he believed was rather over estimated. Most work he thought could be done as well with the ordinary achromatic lens. For an illuminant he always used limelight, the exposure required being much shorter than that with an oil lamp. He agreed with Mr. White as to cutting down the light with the condenser.

Mr. Hern asked whether Mr. Mummery had been able to get coloured photo-micrographs? At the Harveian Society last year he had seen some very lovely specimens of coloured photographs, fruits and flowers, which appeared perfectly natural. It struck him whether, using similar methods for photomicrography, the actual staining could be brought out.

Mr. Gill wished to endorse Mr. Mummery's remarks as to development. He thought it was frequently not realized how great an improvement might be made by a careful study of development. He would ask Mr. Mummery if he had found any particular advantage from first immersing the plate for a reasonable time in "pyro" before using the accelerator or the developer? From his own small experience he found that in many cases he had a great deal more control over the development by this plan.—*Dental Record.*

(*a*) BEADING OF NERVE-FIBRES.

Mr. E. J. Allen calls attention to the varicose or beaded appearance so often presented by nerve-fibres in preparations made by the methylen-blue method, or by the method of Golgi, and to the swellings which occur on the finer nerve-endings. He concludes that both phenomena are due to a simple physical cause—the difference of surface tension between two fluids. He points out that a fluid cylinder surrounded by some other fluid of different surface tension is in a condition of unstable equilibrium, and tends to break up into spherical drops. He has been able to produce almost similar appearances by putting a drop of thick syrup of gum and sugar in the center of a glass slide, which has been covered with a layer of paraffin oil. If fine threads are drawn from the syrup across the oiled surface of the glass, with a rough needle, these threads will, on examination under the microscope, be seen to be beaded, and generally take on all the various forms assumed by nerve-fibres.

(*b*) TERMINOLOGY OF NERVE-CELL.

Dr. Fish proposes a consistent nomenclature; he would call the whole cell with its appendages neurocyte; the axis-cylinder prolongtion, neurote; the other processes, dendrites; and the neuroglia cell, spongiocyte.

(*c*) PRESENT CONDITION OF THE IMMUNITY QUESTION.

In a review of the present condition of the question of immunity, M. E. Metschnikoff remarks that the humoralists have shifted their ground. Thus Buchner now attributes the bactericidal power to leucocytic products, and R. Pfeiffer assumes that immunity is due to liquids secreted by ednothelial cells, while Behring supposes that, besides passive immunity due to the body-juices, there is an active immunity due to cell-function. In passive immunity, set up by serum vaccine or other preventive substances, the author only sees an increase in cell reaction; while even the antitoxic action of humours is also to be ascribed to cell defence, and not to destruction of the toxines.

Facts are quoted to show that the view that bacteria are destroyed by secretions from eosinophilous leucocytes is untenable, while the theory of phagocytosis has constantly received support ever since it was promulgated. Thus the examples which have been quoted as exceptions to phagocytosis (mouse septicæmia, diphtheria, anthrax in Crustacea and Mollusca) are found on close examination to support the author's theory. Moreover, the cholera peritonitis of guinea-pigs, in which degenerated vibrios are found in the peritoneal fluid of hypervaccinated animals, phenomena described by R. Pfeiffer, is explained away as being due to leucocytic products modified by the hypervaccination. The author agrees with A, Kossel about the bactericidal action of nucleic acid, which is only exerted in acid media ; but he points out that intracellular destruction of microbes also takes place in alkaline media. Phagocytes not only react against microbic invasion, but against intoxications from various poisons, e. g. diphtherin, tetanin, ricin, abrin, venin.

Immunity, therefore, is the result of cell activity, and the most important agents in this respect are phagocytes.

(*d*) CHROMOGENIC BACTERIA FROM THE MOUTH.

Dr. M. Freund describes four new chromogenic bacteria from the mouth. *Micrococcus latericeus* develops at blood heat on agar as flesh-coloured colonies, which become darker with age. The cells are, on the average, 1 μ thick, and easily stainable. Gelatin is not liquefied. On potato the growth is but slight and confined to the track, and is of a waxy yellow hue. Both pigments are soluble in water, but not in ether or alcohol. Light and temperature have no influence on their formation ; they are both destroyed by nitric acid, and restored again by caustic potash.

M. citreus granulatus developes both at room and blood heat. forming a slimy chrome-yellow looking film, mostly confined to the inoculation track. The cells are 0.7–1 μ in diameter, and stainable, except by Gram's method. The gelatin is liquefied, but not till the cultures are some weeks old. The growth along the track in thrust cultures is defective, though pretty free on the snrface. On potato there is a moist-looking overlay somewhat darker in colour than that on agar, and by eight weeks the whole surface is overgrown by a granular film. The pigment is soluble in water, but not in alcohol or ether ; light and heat have no influence on its formation. It is at once decolorized by nitric acid, and strong alkali restores it.

Bacillus griseoflavus is 1–1.5 μ long and about 0.7 μ broad ; the ends are rounded. It forms filaments, is without motion, and stains well. On gelatin yellow colonies develope in two or three days, attaining a diameter 1.5–2 mm. Gelatin is softened, and assumes a kind of violet reflex. On agar, temperature does not affect the growth, but the pigment is only formed at low temperatures, and not at incubation heat. On potato a yellowish deposit is produced.

The pigment is soluble in water and not in ether or alcohol. Nitric acid destroys it; caustic potash imparts to the bleached pigment a red-brown hue. The formation of pigment is greatly inhibited by light and heat.

B. viscosus odoraceus is 1.25–6 μ long and 0.7 broad; it often forms filaments, especially at temperatures over 26°. It is easily stainable, but not by Gram. On gelatin, which is liquefied, chrome-yellow colonies are formed. Along the track in thrust cultures the growth, which is colorless, resembles a series of closely packed granules, imparting a very characteristic appearance. On agar, at ordinary temperature, the surface film is of a chrome-yellow color. On potato there forms a granular coherent mass of a yellow hue, but having a dash of green in it. At incubation temperature there is no pigment formed. Both pigments are soluble in water, but not in ether or alcohol. They are decolorized by nitric acid, and restored by alkalies.—*Journal of the Royal Microscopical Society.*

SENSITIVE DENTINE.

It was lately asserted by one who stands as a teacher, that there can be no sensitiveness where there is no nerve, and the remark has been frequently repeated and seemingly accepted as aphoristically true. Whether this be so or not depends upon what is meant by sensitive. Sensation, sensory, sensibility, sensitive, sensitized, sensorial, sentient, and sense, are all derived from the Latin *sensus*, to feel. The signification of the word sensation, as it is ordinarily employed, is an impression conveyed to the centers by an afferent nerve, and this implies the functional activity of nerve tissue. That impression may be pleasurable or painful, or it may even be unrecognizable. There may be a reflex action produced by an efferent nerve, which is the result upon an afferent filament of an impression that was unknown and unfelt at the time. Hence, sensation does not always imply feeling, but the mere ability to respond to irritation.

A sense is a faculty which, through the aid of specially developed organs, is able to receive either external or internal stimuli, and to transmute them into impulses which, when conveyed to the sensorium, we call sensations. These sensations usually imply feeling, or consciousness of them, but not necessarily so. It is probable that the author of the exceedingly indefinite remark quoted, intended to assert that a tissue without a nerve supply was incapable of receiving and conveying recognizable impressions, or those which shall result in efferent impulses. This is not true, for there are too many instances in point which disapprove it. All unicellular organisms are without differentiated tissue, and yet they respond to external and internal stimuli. The amœba withdraws itself at once in response to irritation. The lower jelly-fishes, the protozoa, including sponges and rhizopods, are sentient in the interpretation of endeavoring to escape disagreeable impressions. Even vegetables are in some instances responsive to rude assaults, and the sensitive plant shrinks from the touch of a disagreeable object. The dentine of a tooth, when in an irritable condition, becomes exquisitely responsive to external impressions, and yet it is without nerves or nervous tissue supply.

The secret of this seeming physiological contradiction undoubtedly rests in the physical structure of protoplasm, which is the basis of all animal and vegetable life. It is composed largely of the proteids. and is that which contains the essential elements of all vital tissues, It is the indispensable constituent of every living cell, and in this sense may be considered the essence of life. Of itself it is the vital principle of bone, muscle. connective tissue, and nerve, and is endowed with some of the properties of each. It enables the amœba to move without muscles, to contract without nerves, and to digest without organs. By its aid the infusoriæ keep their cilia in constant action, and thus fulfill the muscular functions of organized existence. It is, in fact, an epitome of structural life, and it forms the broad plane upon which vegetable and animal meet, and in which their separate lives blend into a harmonious unity. It is the initial point from which radiate the various branches that have been differentiated into all functional vitality. Viewed from the protoplasmic standpoint, there is no chasm which separates the lowest vegetable from the highest animal. It is the common ground upon which existences stand, and from and through which the evolutionist traces every development of organic matter.

The dentinal fibrillæ, the gelatinous albuminoid contents of the dentinal tubuli, partake of this protoplasmic character. They are without structure, and hence contain no nerve tissue. But they are composed of the elements that enter into the structure of tissue, they embrace the proteids that are found in the germinal part of the seeds of plants, and like the structureless sarcode of the protozoa, while without sentient feeling they are capable of response to external impressions. The dentinal tubuli have this albuminoid composition, and they are in relation with organized tissue. Their connection with the tissue of the pulp is continuous, and that tissue is fully organized and has an abundant nerve supply, through which the impulses originally received by the protoplasmic, gelatinous dentinal fibrillæ, are conveyed to the sensorium.

Protoplasm, being non-vascular, it cannot exhibit the usual phenomena of the inflammatory process, but that there may be some of the pathological changes that attend that condition must be indisputable. If it responds to external stimuli it must also be responsive to that which is internal. If it is subject to irritation at all, the continuous application of provocatives must result in an exacerbated, exalted receptive condition that makes it unduly and abnormally susceptible to exasperative agents. And that is just the condition of exposed and irritative dentine. In its normal condition, while the fibres may convey external impressions, it will be but faintly, and they will not be of a distinctly painful character. Under the goadings of repeated stimuli and of continuous exposure to external influences, they take upon themselves that exalted condition that greatly increases their receptive and transmissive power, and the impressions conveyed to the pulp and to its nervous filaments, and thence to the nerve centers, become of a distinctly painful character.

The dentinal fibrils being of an albuminous nature, when their connection with living matter is severed and they are subjected to the influence of the air and external agents, coagulation will be spontaneous, as this is the first step in the process of their melting and breaking down.—EDITORIAL, *Dental Practitioner and Advertiser.*

DISCUSSION OF COAGULANTS AND NON CO-AGULANTS.

Dr. JARVIE : I think it is unfortunate that I should be the first to be called upon to speak on this paper, because scientifically I know nothing about the subject. However, certain thoughts have come to my mind as I have listened to Dr. Harlan speak to-night in opposition to what Dr. Kirk read to us a year ago, and to what has been given to us by Dr. Truman sincc that time. As a layman who has made no experiments, but who bears in mind a little of what the hree gentlemen (who are very earnest on the subject) have said, It am left in great doubt, as it must leave every other person who is situated as I am, as to what is the best agent to use to sterilize a pulpess tooth, or a tooth with a putrescent pulp. We are told by the essaayist to-night that if we use any of the coagulants, zinc, chlorid or carbolic acid, we will prevent the very thing we are endeavoring to accomplish ; that coagulation will take place at the mouths of the tubuli and render it impossible for the antiseptic to penetrate the coagulum into the tubuli, and so the putrescent matter that is already in the tubuli cannot be reached, and by osmosis the septic matter may reach the cementum and pericementum. If we use the essential oils we have not a coagulant, but we have not nearly as powerful or as rapidly penetrating antiseptics as we have with the coagulants. According to Dr. Miller and others, after corrosive sublimate, which we all admit is an unwise agent to use in the pulp-canals of the teeth, next in order of strength is the chlorid of zinc and carbolic adid. A year ago Dr. Kirk showed us experiments. He showed us the teeth in the tubes, which, if he was at all skillful and truthful, and I think he is both, showed us where the coagulating agents had passed through the coagulum and reached the farthest limits of the tubuli, and passed out through the cementum into the albumen in which the tooth had been immersed. We are told to-night that Dr. Kirk did not analyze that albumen ; that he only supposed from the appearance that the coagulants had passed into it.

I think that clinical evidence ought to have some weight in this matter. A large majority of the gentlemen in this room have not tried any of these experiments. We depend very largely upon the result of experiments of such men who devote time and energy and skill to making these tests,—men like Professor Harlan, who has been kind enough to come from Chicago, and Dr. Kirk, and Dr. Truman, and Professor Miller. We depend very largely upon what these men tell us, to guide us as to the agents we should use. After having used these agents, each one ought to depend very largely on the result of his own practical experience in the use of them. Now, if some of us have been successful in the treatment of teeth with putrescent pulps by the use of coagulants, we must think that coagulants are of some value. There are many gentlemen in this room who probably, at a certain point in the treatment of such teeth, hardly use anything else than such coagulants. The essential oils are used, but not to the extent that carbolic acid or chlorid of zinc are used. The gentlemen who use coagulants are successful. Whether they are as successful as the men who do not use them, but use the essential oils in their place, I am not prepared to say. I am guided somewhat by that in the remarks that I have made. This is certainly a case in which the doctors disagree, and yet the patient gets well sometimes by the use of exactly opposite agents.

Dr. J. MORGAN HOWE, of New York : I am not specially prepared to discuss the subject, but will raise the question why clinical experience is not considered of greater importance than it seems to be. Probably most of us have seen innoccuous pulpless teeth remain in the mouth from five to twenty years without any root-filling whatever, notwithstanding the dentinal structure has been saturated with the putrescent contents of the pulp-canals. The presumption is that the apical foramen in all such cases is occluded. Cases in which irritation of the pericementum occurs have the apical foramen open. Perhaps a solution of the occluding substance has taken place, but, however that may be, we almost invariably find that the irritation which demands our interference has been effected in the tissue beyond the apex, in connection with an open foramen. It appears to me to be a reasonable conclusion that septic matter in the tubuli of the dentine does not cause irritation of the pericementum. In the next place, it seems to me to be settled by clinical experience that coagulating substances used to disinfect pulp-canals are effectual. Whether diffusion into the structure of the dentine takes place or not, such teeth are filled after disinfection, and are successful, almost invariably, in proportion as the root-canal has been well filled and at the proper time. Dr. Harlan says that he concluded from observation of teeth that had been treated and the roots filled, that the septic bacteria occupying the tubuli of the dentine had something to do with the irritation that caused these teeth to need further attention. That is as I understood him. It would seem to me that the need of attention more probably arose from imperfection in the root-filling. If the root-canal itself had been thoroughly disinfected, and even an approximately perfect filling had been inserted, the chances are greatly in favor of that tooth not cnusing further trouble.

I wish to emphasize the importance of clinical observation, and to suggest that experimental work that contradicts it is likely to be at fault. I appreciate the efforts that have been made *pro* and *con* on the subject of coagulants and non-coagulants, but I cannot believe that the mere question of the diffusion of these substances has such immense importance in regard to the cure and subsequent inhibition of pericementitis. I think we may come to change our methods in the process of accomplishing the object, but other agents will commend themselves for their therapeutical or chemical properties, whether coagulants or not. Without taking sides as to whether coagulants limit their own diffusion or not, I would affirm my conviction that coagulants have served us well in the past, and that on demonstrations in the laboratory can change that opinion.

Professor HEITZMANN, of New York: A microscopist is called upon to decide the question with his instruments. I am sorry to say beforehand that the verdict of the microscope is not in favor of the essayist. I know from observation with the microscope that when there is putrefaction in the pulp there is no doubt a possibility of the infectious materials, the ptomaines, the micro-organisms, being carried through the canaliculi and through the cementum to the pericementum ; but if you apply what the gentlemen call coagulants, which I know very well in their action, the pulp is destroyed. You besides destroy all the infectious material, and what becomes of the tenants of the canaliculi then ? They are killed, because the source of life and nutrition—that is, the pulp with its blood-vessels and lymphatics—is removed. I had the pleasure of listening to the demonstrations of Dr. Kirk last year, in Brooklyn, and I can assure Dr. Harlan that the evidence given by Dr. Kirk was convincing as far as isolated teeth are concerned. Of course, if Dr. Harlan claims that the pericementum around the root may alter the experiment, it may be true. What I saw I take as a perfect evidence of the permeability of the canaliculi. Look at the canaliculi with a microscope, after the coagulant has been applied. They have kept their shape, but the tenants, the threads of living matter, are shrunken and dry. Do you suppose that this dry material within the canaliculi is a fit pubulum for the infectious material ? No. The bacilli are gourmands ; they know what to feed upon. If you remove the living material by cutting off the supply, you lead to death all the micro-organisfms that are present in the canaliculi. Dr. Harlan has a somewhat speculative turn of mind, I believe. His whole paper is a kind of self-defense against the remarks of Dr. Kirk. Dr. Harlan speaks of a coagulation of the basis-substance. That is impossible. If Dr. Harlan claims, as he does, that a coagulant will coagulate the matrix, the so-called basis-substance, which is glue-yielding, he is mistaken. There is not the slightest doubt that the glue plus lime-salts cannot be coagulated. It is perhaps the minimum of living matter, the presence of which Dr. Hart has demonstrated, that may coagulate, but that hardly counts. I cannot see what else can be coagulated by the application, except the pulp-tissue itself. I even doubt that the coagulant will ever enter a canaliculus. For so many years the dentists did not know what the tenants of the canaliculi were. The celebrated John Tomes suggested they might be nerves, which, of course, is not a tenable theory, I wes myself who showed that they are fine filaments of living matter. So long as the tenants and their nature were unknown, we might have said teat the coagulants could penetrate into the canaliculi; but to-day, when we see the effect under the microscope, how they shrivel up, as Dr. Hart has shown with the chlorid-of-gold method, I do not think there is a chance for Dr. Harlan to imagine that the coagulant has penetrated into the canaliculi. We often come across specimens of filled teeth. I had the good luck to see specimens of fillings that Dr. Bödecker made, on a large scale, in a series of experiments with different materials. I can tell you that if you apply to the walls of the cavity carbolic acid, which every one, I believe, admits is a coagulant, you destroy the life of the dentine to a certain depth, and the rest of the dentine is kept alive. The teeth filled by Herbst plainly show this possibility; but if you do it in a centrifugal way, if you kill the whole pulp, life is removed from the dentine throughout. If mischief arise. after a filling, in the sense of Dr. Harlan, is is not the material as such that is to be blamed, but it is a mistake in the filling. As Dr. Carr once remarked to me, "I sometimes take the utmost pains to have a root-canal filled, and nevertheless, I get pericementitis and plenty of trouble; sometimes a poor patient comes in, with whom I do not take such pains, and the tooth is perfectly comfortable and remains so for a number of years."

Dr. C. E. FRANCIS, New York: I have listened with interest to the excellent paper of our esteemed friend from Chicago, and feel that we are all greatly indebted to him for having come so far to give us the result of his experiments and observations. I have greatly enjoyed listening, also, to our good friend Dr. Heitzmann, and also to the practical remarks of Drs. Jarvie and Howe, and feel that I have learned much from them. The subject under discussion has caused a considerable contention of late in various sections of the country, and there seem to be decided differences of opinion in regard to the theories advanced. I would hardly venture to express an opinion, and have it stand by the side of the statements of gentlemen who have given this matter careful study. Recently I received a letter from Professor Barrett, of Buffalo, which makes allusion to this subject, and I have copied extracts from it. If it be the pleasure of the gentlemen present, I will read them. Dr. Barrett also sent me an advance sheet of an editorial which was prepared for the *Dental Advertiser* for the present month on sensitive dentine, in which article he takes exceptions to theory advanced by our essayist of this occasion. It might be out of place for me to read the editorial now, as it is on the subject of sensitive dentine, and has already been published, but so much of it as refers to the subject under discussion to-night I will give you:

"The dental fibril being of a protoplasmic albumoinoid character, it must coagulate as the first step in its melting down. Of course, it cannot remain in a tubule permanently in its normal condition—that is, with vitality—and it must melt down. The very first and necessary step in this process is coagulation, so that it follows that coagulation is the very thing that should primarily be brought about. If it is not done artificially, it will be spontaneously, for albumen *must* coagulate as the very first step in the process of melting down. Hence I believe Dr. Harlan to be radically and positively wrong in his hypothesis, and that it is exactly the opposite of what he advocates that should be artifically induced. Coagulation of the contents of the dentinal tubuli should be induced, that the dentine may be made aseptic. The contents of the tubuli being removed, and the territory being made sterile, there is no chance for a septic condition, and the tissue is permanently conserved. The treatment then should be in case of the devitalization of a pulp :

"First, the devitalization

"Second, coagulation of the dentinal fibrils.

"Third, an opportunity for them to melt down.

"Fourth, careful sterilization of the territory.

"Fifth, sealing up of the tubuli by the proper root-filling.

"Hence it will be observed that I place coagulation at the very outset of the process as a necessary step in the conservation of a root. If the pulp shall have been dead for some time, this coagulation will have taken place spontaneously. The dentinal fibrils will have been melted out of the tubuli, and it but remains to make the canal and the tissue aseptic. If it is already in a septic condition (I mean the canal, for I recognize the same septic state in the dentine that there is in the soft tissue), it may be reduced to a state of sterilization, and then filled. That, to my apprehension, is all that there is to it."

Dr. S. G. Perry, New York : I can only speak on this subject from the clinical standpoint. I do not pretend to positive knowledge from the chemical standpoint. Many years ago, when, as some of the older members may remember, it was our habit to try occasionally to save pulps alive, by the use of chlorid of zinc placed directly in contact with the actually exposed pulp alive, many of us thought we had succeeded in saving the pulp alive, because afterward there was no disturbance, beyond the pain which lasted for a few days, and the teeth retained their color for a long time, so we flattered ourselves that we had saved the pulps alive. Many of us congratulated ourselves on having made a new departure ; but in course of time, we found, as we opened into those teeth, that the pulps were not alive at all. They were dead as door-nails, but they were in a peculiar condition. I do not know whether I ought to say they were shriveled up, because they were not exactly so. I might say they were coagulated. They were in a quiescent state. There was a clear point gained, and it is but one step further to reason from that to the point of considering each tubule in the tooth as being a minute pulp, and if the oxychlorid of zinc applied in that way to an exposed pulp would so act upon it as to put a quietus upon it, how naturally the next conclusion would be that if the pulp were removed, the same action would be had upon the tubuli. You will see how natural it was that the oxychlorid of zinc should be accepted as the best material for filling teeth, of course from a clinical standpoint, because at that time, and even now, none of us claimed to know much about it. I have come to the conclusion that, after all, the best material for the filling of the roots of teeth, whether the pulps had been recently destroyed and removed, or whether in cases of old, dead teeth, is oxychlorid of zinc in some form, and I do not think I have ever had as good results from any other material. I do not know what the action is, and I cannot say why I have had better results from it; but it is a fact, and the thing for a dentist is to "get there," whether he does it from a theoretical standpoint or not. I had supposed, however, that chlorid of zinc was one of our best and most permanent germicides.

I recognize, however, the fact that as Dr. Harlan stated there are cases, and I am sure we all have had them, where in the use of oxychlorid of zinc in fluid form we have had that after-trouble which would seem to imply that it does penetrate, and have the irritating effect that he suggests. He claims that no irritation follows the use of the essential oils. So I have sometimes been staggered; but my safeguard or relief from that has been to use it conservatively and carefully, and to be extremely careful about pumping it through the end of the root, never being anxious to use it in too fluid a form.

I remember about ten or eleven years ago last spring, before the Odontological Society, I suggested that microbes at the roots of the teeth were causing most of the trouble that comes from dead teeth. A broad grin went around, like a poor man's lease, from year to year. I said that the contents of the dentinal tubuli were excellent pabulum for those microbes, and might be compared to a spring chicken, a little stale and somewhat tainted, which, being inadvertently eaten, might give one an active diarrhea the next morning, and which no one then would have supposed was caused by microbes, but which every one to-day knows is caused by nothing else. Don't you think, gentlemen, I have a little satisfaction in knowing that what I was laughed at for then is being recognized as truth to-day?

Dr. M. L. Rhein: It would seem to me as though the agitation of this subject, as we have listened to it for the past few years, should bring some great material benefit to us in our practical work in this direction, and I believe it will in the future. Up to the present time I do not think we have acquired, as a whole, any practical gain from this subject, but it is bound in the end to bring about a clearer understanding of our methods of procedure in the roots of teeth as soon as we are sure we have reached the truth of this matter. It is the one place in which the dentist works in the dark; that is to say, when he is inside the canal of a root he has gotten beyond the point where everything is absolutely open to his eye. To this fact are due many of the errors and mistakes in treating root-canals. To my mind the agitation that has been started between Dr. Harlan and Dr. Kirk would not amount to much if we could get them both together. The unfortunate thing is that they alway appear separately, and the other man is always absent. I have had the pleasure of discussing this question with each of these men at some length, and, astounding as it may seem, can see very little difference in their views. While the titles of their respective papers are antagonistic to each other, I have come to the conclusion their differences on the chinical aspect of the question are but slight, and that is what interests us. As far as there is any difference at all, the difference seems to be as much in favor of one as in favor of the other. That seems to be somewhat of a paradox, but you are all on the fence on this question. Many of you this evening incline to Dr. Kirk's side of the case, and yet you do not jump over with the vehemence that is characteristic of a cause worth fighting over. To start with, they differ as to what are called coagulants. They do not agree as to all so-called coagulants. In my own mind, I think we must distinguish between the action of different coagulants. All of them do not work in the same way. That chlorid of zinc has clinically demonstrated the fact that it will preserve the pulps of teeth for years we all know, and yet many of us are aware that creasoted pulps will not be preserved in the same way. Why is there any such difference between different coagulants working in the same way? If it is merely a question of coagulation, then they ought to work the same whether they are coagulated by carbolic acid, bichlorid of mercury, or creosote; but, judging from a clinical standpoint, they certainly do not act in the same way. I think coagulation of pulp-tissue is not the vaunted remedy for the preserving of devitalized teeth for which this claim is so often made. On the contrary, I cannot see anything in its use but the leaving of a condition of affairs that is liable, however late it may be, to be the starting point for future trouble, and in this one matter I cannot help but agree with Dr. Harlan in his paper. Even if you preserve a tooth for twenty years in this way, if a breaking down of the health of a patient occurs in such a way that he is subjected to some enervating disease, where his vitality is not in a condition to resist the inroads of disease, that tooth will, if it has coagulated pulp-substance within it, be a favorable place for the invasion of septicemia. As to the question whether volatile oils will not diffuse through coagulated tooth-structure, or tooth-structure that has been treated by coagulants, in that respect my clinical experience does not agree with the author of the paper. The reason I have for making this assertion is that the method of procedure which I have for treating canals consisting, after my canal has been thoroughly cleaned,—and, by the way, I do not care what method is pursued, or what side is taken, I claim that if the canals of a tooth are thoroughly cleansed, it makes no difference then what side of the fence you are on on this question,—having cleansed a canal thoroughly, my next step is to thoroughly sterilize it by a so-called coagulant. I consider the best germicide for the purpose to be bichlorid of mercury in a solution of peroxid of hydrogen. Having done that, and dried out my cavity, in order to prevent any possible irritation around the periphery of the root, I then hermetically seal in that cavity a silk thread impregnated strongly with oil of cinnamon, and it has been, in the majority of cases, my clinical experience that my patients will come to me afterward, not within a year or two of the sitting, but perhaps on the following day, and say, "There must be something wrong with that dressing, because I taste cinnamon oil all the time." Clinically, I cannot account for the taste of cinnamon oil in any other way than as a diffusion of the cinnamon oil through the root, which is exactly the reason that I inserted it for, and consequently my views do not coincide on that point with the essayist's remarks.

The only other point I wanted to mention was the one that Dr. Howe spoke about. I would like to call attention to it, because I question whether he did not make a statement which he hardly meant. He spoke about putrescent pulps remaining in teeth, the ends of which were occluded for years without giving trouble. Did you mean putrescent pulps, Dr. Howe?

Dr. HOWE: I meant devitalized pulps.

Dr. RHEIN: I could hardly understand a pulp which is in a state of putrescence remaining in a quiet state for such a length of time without any vent for the gas that would be formed.

Dr. O. E. Hill, Brooklyn: The great fault with all scientific men, and men who talk on scientific subjects, is, as I understand it, that which is called science to-day is the utmost nonsense to-morrow. Time, clinical observation, clinical experience, must prove whether what these gentlemen say is true or false. I wish to relate a little incident. This very day I crowned a lateral incisor, the root-canal of which I filled twenty-one years ago with gold. In removing the root-filling to enlarge the canal, there was the odor of creasote just as pure as when I put it in. That creasote must have penetrated the tooth. Many of you have had similar experience. That is why I do not care about your coagulants or what they will do. That same patient has no less than six teeth in his mouth that were filled previous to 1881. They are all single-rooted teeth, except one bicuspid, which is probably not. I took particular pains to examine my books, so what I say here to-night is true. Dr. Kirk was, to my mind, very conclusive. About Dr. Harlan I do not exactly know what to say. Of course, he is thoroughly honest; there is no question about that. He believes just exactly what he says. Dr. Kirk believes precisely what he says, and my friend Rhein says we are all on the fence. We are not. We are between those two men, and we are doing and practicing what our experience has taught us to practice. They are each trying to prove different things. In the mean time we will go right on with what we have been doing for the past thirty or forty years, and done successfully. We do not all want to be chemists, because if we were we would not be good dentists, for chemistry is a specialty.

Dr. J. W. Wassall, Chicago: I have not much to say on the subject, but, as Chicago seems to be getting the worst of it, I think it is charitable of the president to give Dr. Harlan's fellow-citizen a chance to help him out. In the treatment of pulpless teeth, there are two classes to be considered,—teeth in which we have devitalized the pulp, and teeth in which we find pulps already putrescent. I take it that teeth with putrescent pulps are the only ones that are properly under discussion to-night, although the others have been mentioned. In these cases, we have a zone of septic dentine between the living cementum and the pulp-chamber. Of course, the pulp-chamber can be easily cleansed of its putrescent contents. This zone of dentine is the part of the tooth to be sterilized, to put the tooth into a healthy condition,—that is, in a condition where it will give no trouble in all the years to follow. It stands to reason that any drug introduced into a pulp-chamber which will prevent the penetration of the sterilizing agent into the dentinal tubules, will prevent us getting an aseptic condition of the tooth, and I think that Dr. Harlan's experiments, and the definition of the term coagulant, prove to us that we should use no coagulants in the treatment of teeth containing putrescent matter. We should use only the agents that will most easily penetrate into the tubules of the dentine.

Dr J. MORGAN HOWE: For about a year and a half I have used electrozone for sterilizing pulp-canals, and more recently I have used it in the treatment of pyorrhea, with verv good success. I believe that electrozone is not a coagulant, but I have been indifferent to that question. I have found that electrozone does not produce irritation at the so-called apical space, but tends decidedly to reduce inflammatory processes. It is very effective as a disinfectant, and these qualities have induced me to continue its use. I have treated many teeth from the beginning to the end with no other medicament than this, and have filled them without any subsequent cause for regret thus far. Dr. Rhein's reference to the different qualities of agents that we use is important. There are medicinal qualities in many of the agents that we have used that have not been sufficiently recognized. These have received too little attention, the tendency being to regard and speak of them in classes as coagulants, antiseptics, and so on, without regarding the therapeutic action which each agent has peculiar to itself. In regard to putrescent pulps, when Dr. Rhein asked me I did not quite understand the gist of his question. I did mean putrescent pulps.

Dr. J. F. P. HODSON, New York: I just rise to say two things. One is that about twenty years ago I suggested before the Odontological Society, and very urgently, that carbolic acid should not be used in devitalized teeth. I was urging its employment in all cavities in live teeth, in that its coagulation of the contents of the dentinal tubuli for a tiny distance would produce a non-conducting "head" to each fibril, and thus a perfect non-conducting lining to the cavity, to prevent shocks from thermal changes through the filling, without using up the cavity depth with more tangible non-conducting materials. But for the same reason (the coagulation of albumen) I deprecated its use in devitalized teeth, as I felt that the fixing of the fibrillæ into coagulum produced the very plugs in the microscopic orifices of the tubuli which, though so peculiarly valuable in the live teeth, would here, on the contrary, make it substantially impossible for me to ever thereafter reach the more discolored portions beyond, to remove the offensive color, which always seems to me to be about as hurting a stain upon the reputation of the operator as upon the tooth, consequently I turned to other methods of disinfection and treatment, but in the employment of those things which Dr. Harlan has, of late years, suggested, mainly the essential oils, I found much discoloration to ensue,—I supposed from their oxidation,—and so discontinued their use. Will he kindly tell me wherein I used them wrong, as it is evident he has solved this difficulty?

I do not quite agree with the majority of the speakers to-night in respect of their believing so strongly and so exclusively in the value of practical experience. Undoubtedly it is good, undoubtedly it is the proving; but if we are to depend wholly and only upon clinical experience and not at all upon theoretical study, why that is what the charlatans do. Surely theory and practice should go hand in hand. One should prove the other.

Dr. **Levi L. Howell**, Riverhead, L. I: I believe it was three years ago that Dr. Harlan was here. I am surprised to hear so many gentlemen say after that beautiful clinic that they know nothing about this subject. I went to see Dr. Harlan about it, and tried to get all the information I could. I can give you a record of four hundred teeth with putrescent pulps treated by his method, and you cannot find five per cent. of failures in those four hundred. I went home imbued with what he said. Two of my students are here to-night, and they will tell you that they have never seen a coagulant on my operating table for the treatment of such a tooth. I went into one of your colleges the other day. The students were operating. No less than four had a case there, trying to treat it. I showed one of the students the treatment of Dr. Harlan. They had been using the coagulants, and yet non-coagulants saved that tooth, and that was in the dental college of this city. When this essayist comes to you and gives this beautiful demonstration, and men tell him they know nothing about these things, or not enough to discuss them, I do not think they are sufficiently informed to criticise his paper.

Dr. **F. Milton Smith**: The suggestion was made that clinical experience should not count. If I mistake not, our friend Dr. Harlan, almost in the first of his paper, referred to his clinical experience, and it seemed one reason why he discarded the coagulant treatment. I understood him to say that where he was treating with coagulants he found they gave trouble. It seems to me this is a broad statement. Dr. Rhein has also made the same statement. I would like to ask Dr. Harlan, in case of treatment either with coagulants or non-coagulants, taking for instance one hundred cases, how many out of that hundred should prove perfectly comfortable at the end of a year, in order to prove that either coagulation or non-coagulation was the successful treatment? My thought is that in order to say that a certain method of treatment is not successful, we must consider more than one or two or ten cases. Dr. Howell has stated that he has a clinical record of four hundred cases with non-coagulants. I can give you a record of more than five hundred successful cases with coagulants. What does this prove? I can bring to you a gentleman who for ten years has exclusively used coagulants, and I believe he has succeeded in nine hundred and ninety-nine cases out of a thousand. It proves this, and nothing else,—that it is not the question of coagulants or non-coagulants in the treatment of teeth. Dr. Perry has stated that in his experience the oxychlorid of zinc was the best material to use, and he also recommended chlorid of zinc. Five years ago I read a paper before the Second District Society describing a plan of treatment which was brought to my attention by Dr. A. J. Reinhold; after thoroughly cleansing, treating with either pure carbolic acid or chlorid of zinc, a twenty per cent. solution, and only treating once in case of a putrescent pulp, thoroughly filling that root with a solution of gutta-percha and iodoform dissolved in chloroform. I can give you, out of my practice, more than five hundred successful cases. I believe that this goes a great way toward establishing the fact that it is not a question of coagulants or non-coagulants. I have never heard that Dr. Shields puts coagulants in teeth. He says he fills them with gold clear up to the top. I believe he does it. I cannot do it. It seems to me that this matter of coagulants or non-coagulants is not as important as the essayist would have us believe, but the great thing is, after all, thorough work.

Dr. RHEIN: I stated directly the opposite of what Dr. Smith said. I stated that both methods, the use of coagulants and the use of non-coagulants, as exemplified by Dr. Harlan, were successful. I took the same ground as the speaker, and not the ground that I found the use of coagulants gave bad results. I tried to make it clear that I believed the success lay in the thorough cleansing of the canals. Do this, and either method will lead to success. Fail in this, and abscesses will always be a probable sequence.

Dr. HARLAN: I believe I have been the most entertained person present. The question of the hour, to which I came to reply, was, "Do coagulating agents prevent their own diffusion through tooth-structure?" I thought I had answered that question. I did not enter into the question of the relative values of coagulating agents and non-coagulating agents in the treatment of pulpless teeth, except in the conclusions. I did not give any reasons for the use of non-coagulating agents in my paper.

Summing up the discussion,—

Dr. Jarvie says that doctors disagree. That I am willing to admit.

Dr. Howe says that clinical experience is the arbiter of everything. If you are successful when the canal has been filled, diffusion is of no importance.

Dr. Heitzmann says, "I doubt very much if a coagulant can enter a canaliculus," and I am quite willing to subscribe to that. Does not that prove my position? There is nothing plainer than that. We have one of the best microscopists in the world right here to sustain me in his own words.

Dr. Francis quotes Dr. Barrett, who is not an all-around histologist. He says that coagulable material must be melted down. That is the ultimate outcome of his statement. If it is melted down, it prevents the coagulator from passing through. Air is the best coagulant that nature produces. There is no coagulator that is better than air when it comes in contact with blood that is pouring from an artery or a vein.

Dr. Perry's remarks are extremely good. He did not discuss the question in my paper, but what he did discuss was correlative to it, and hence not only passes, but has a high mark.

Dr. Rhein says if Dr. Kirk and Dr. Harlan got together, everything would be all right. It is all right anyhow. The only difference is, that I have studied this question for more than fifteen years, and Dr. Kirk studied it for a few months before he read his paper. He wanted to prove that coagulating agents did not prevent their own diffusion through dentine and cementum, and he did not prove it; that is, in the experiments you saw made you think they had passed through, but he did not exhibit any specimens with carbolic acid, which is the sheet-anchor of the average practitioner throughout the United States and the world. If he does not use carbolic acid, he uses creasote; and when it stays in a tooth twenty-one years, as cited by Dr. Hill, and exhibits its odor at the end of that time, it shows that it had not passed through.

Dr. JARVIE: I want to ask Dr. Harlan a question here, for fear I misunderstood him. From your remarks, I understood that the question that Dr. Kirk took up as to the diffusion of the coagulants through a coagulum was an inconsequential question. I thought that was really the question of all questions involved between you.

Dr. HARLAN: It is inconsequential, because the use of coagulating agents was not defined. His experiments with reference to membranes through which coagulating agents passed, had no relevancy to this question whatever. His discussion of the doctrine of osmosis did not cut any figure at all. It was merely incidental, and led up to the main question. The only question was, "Do coagulating antiseptics prevent their own diffusion?" and he says they do not.

Dr. JARVIE: And you believe they do?

Dr. HARLAN: Yes, and I can prove it.

Dr. Howe says he has been using for a year and a half electrozone, which is a non-coagulator, and he recommends every one to use it. If he does this, it must be because it is better than carbolic acid or chlorid of zinc. It must have some merit.

Dr. Wassall introduced a question which I did not mention in my paper, but upon which, if you will permit me a moment, I will elaborate. When the pulp of a tooth is destroyed, intentionally, by the use of orange-wood dipped in carbolic acid, or anything else, or by the use of arsenious acid, it is the evident intention of the operator to remove that before putrescence takes place. After he does so, and he has no putrescible matter in the tooth, and he treats that tooth with a coagulating antiseptic, there is no objection to that, because there has been no absorption, infiltration, imbibition, penetration, or permeation of any cadaveric alkaloid, micro-organism, ptomaines, or any of the spores of pathogenic micro-organisms, and if he fills the apex of the root that coagulum will not be broken down. I will repeat that if you wish; in other words, I say, if you destroy the pulp of a tooth in any way intentionally, and do not allow the pulp or the pulp-canal to become contaminated from external sources in any way, and you remove the pulp and dry it, and introduce a coagulating agent, and fill the root, there is no objection to that, because no anaërobic micro-organism can gain entrance to that, unless there is destruction of the peridental membrane or cementum, or tearing down of the dentine, and getting it into the pulp-canal in that way. I am perfectly familiar with conditions of that kind, although I never studied in Dr. Heitzmann's laboratory. (I have great reason to be thankful to him for sustaining me to-night, unconsciously though he did it.) If the pulp of a tooth becomes destroyed by accident or design, and is left to be contaminated, and it is decomposed, and gases of decomposition come out of the opening in the tooth or pass through the apical foramen, and we have a blind abscess or an acute abscess, and afterward the dentist wishes to treat that, and does treat it, and he applies the rubber-dam and washes it out and cleans it, and gets rid of everything that he can in a short time, fifteen or twenty minutes or perhaps an hour, then introduces chlorid of zinc, or carbolic acid, or bichlorid of mercury, and immediately fills the root, in six or eight years afterward, or perhaps in three months or less, that patient has trouble, because he has sealed within the open ends of the dentine tubes exposed toward the root-canals various poisons, the nature of which he does not know, because he has not sterilized them. If he does not use a sterilizing agent which will pass through and neutralize and destroy and alter and change these poisons, or prevent the future growth of the spores of the pathogenic micro-organisms which may be there, then he would leave that tooth in a bad condition.

This is a general classification, but I have allowed you all to talk so long that I want a minute or two to make myself understood. That is the class of teeth in which I object to the use of coagulating agents. Chlorid of zinc is an incinerator, a burner-up of albuminous matter. It will destroy silk or cotton. Nobody needs to know more than the primer of chemistry to know that. Carbolic acid is generally used at ninety-five per cent. or thereabouts. The formula of serum-albumin I will not burden you with, because you can easily work it out yourself. There is a chemical change when carbolic acid comes in contact with albumin ; there is a chemical change when corrosive sublimate comes in contact with albumin ; but there is not a chemical change when chlorid of zinc comes in contact with it. It has a great avidity for water, and as soon as that avidity is satisfied it goes no further. It does not pass into the tissues at all.

Dr. Perry : In a pulpless tooth, is there any albumen at the opening of the tubuli, which you would liken to the albumen of an egg ? Is there anything to be considered at that place and anything to be used at that time beyond something to kill the germs ? Is it possible to reason so closely and so finely as to say you are actually coagulating albumen in a tooth which has been dead for years ? This is merely a question, and not intended as an argument.

Dr. Harlan : When the pulp of a tooth dies of its own accord by accident, or through regulating teeth, or through anything like that, and we do not have an abscess at the apex, either blind or fistulous, the end of the root of that tooth becomes encysted. There is a growth that takes place there, numerous instances of which I suppose our friend Dr. Heitzman has seen. When you open into a tooth of that kind, you find the pulp is shriveled up, although no coagulating agent has ever come in contact with it. You find it without odor. That kind of a tooth does not have any albuminous matter between the cementum and the pulp-canal that can be coagulated, because that is more nearly analogous to mummification than anything else, and that mummification cannot be produced with chlorid of zinc. If you open into a tooth of that kind, and find the canals moist, then you have albuminous matter that may be coagulated in the dentine of the tooth. In all probability there is more water in the dentine of such a tooth than would be found there normally; but at a little greater depth, the contents of the tubes, or the canaliculi, are not disorganized, and this water is capable of being coagulated, if an agent is applied which will take up the water. If the coagulating agent at that time is applied before any attempt at sterilization or disinfection is undertaken, you may find that still beyond that point of coagulation there is poisonous matter within the dentine that would, if left there, ultimately cause a breaking down of the peridental membrane, and that would account for a great many of the lame teeth that are treated so superficially and so generally, as practiced by the so-called immediate root-filling method. Of course, this question that you have asked me is not really relating to my paper, but I make this explanation at this time simply to indicate what my position is in this matter.

Dr. Hodson says he recommended more than twenty years ago that carbolic acid should not be introduced into pulpless teeth, because it prevented their easy bleaching, in which position he is entirely correct; because the bleaching agent will not pass through the coagulum that is produced in the mouths of the tubes. Dr. Heitzmann smiles, but that is where Dr. Heitzmann takes a back seat. This is a practical subject; that is why I say that, no disrespect being intended to Dr. Heitzmann.

Dr. Hodson wants to know why the essential oils discolor. Some of them do not. Oil of cassia has a coloring matter which will permeate a tooth from one end of it to the other, up to the enamel and through the cementum. It will pass out through the cementum. In more than seven hundred teeth that were planted in plaster of Paris and other substances, we found that oil of cinnamon and oil of cassia could be recovered from the plaster of Paris in from twelve hours to three months, showing that it passed entirely through the tooth and went into the plaster of Paris. When the plaster of Paris was ground up and water added, we would find that the oil could be detected by chemical test in the water. The oil of myrtle and the oil of thyme will not discolor a tooth, and there are a number of others. Old oil of turpentine would eventually discolor a tooth.

Dr. Howell spoke of the exhibition that I gave before the First

District Society in 1889. That was the first demonstration of the use of coagulating agents that was ever made before any dental society in the world. I simply demonstrated that certain agents would coagulate albumin, and certain others would not. My opinion was at that time that the non coagulants were the best.

Dr. Smith asks a question about what are the comparative results with different methods of treatment. I have never taken a single hundred of teeth that had been treated one way, and a single hundred of the other kind, but from 1869 to 1831 I used coagulants in the treatment of pulpless teeth ; I have always lived in one city, and have seen the results of my treatment and that of other gentlemen, and I determined that it was not the best practice to use coagulants.

I have used non-coagulating agents longer than I have used coagulating agents. I think it is a doubtful question whether the user of coagulating agents succeeds in closing many of the fine canals. He often succeeds in preventing the complete filling of the root-canal, and afterward there will be a permanent lameness of the tooth, or a small abscess if it is a three-rooted tooth, from the one having the most minute opening, and that will account for many obscure neuralgias or uncomfortable feelings on one side of the face that many patients are treated for by their physicians. If they fall into the hands of a dentist who is unfriendly, he will discover that one portion of the root is unfilled, and that is probably the one that was treated with the coagulant. It could not happen with a non-coagulant. It does not solidify. If there is a portion of the pulp of the tooth remaining there, it would produce the abscess just the same in all probability, because that kind of material would be susceptible of disorganization through the agency of micro-organisms, the same as anything else.

Dr. Watkins : I would like to ask if you have made experiments with eletrozone as a coagulant or non-coagulant ; and in asking that I would like to state that Mr. Woolf, the discoverer of electrozone, made experiments with it, and he showed to us quite conclusively and satisfactorily that electrozone was not a coagulant ; that it destroyed the albumen, cut it all up, so that it had the appearance of water, where carbolic acid, sulfuric acid, and bichlorid of mercury coagulated very readily. In the same experiment he exhibited those different materials, and applied them to water which had an aniline matter in. In each case he applied fully half an ounce, or perhaps an ounce, of these three remedies, carbolic acid, sulfuric acid, and bichlorid of mercury, and they would not destroy the aniline matter. He applied one drop of the electrozone, and it destroyed the aniline matter in the course of two or three minutes, so that it had the appearance of being clean water. He stated that there were two kinds of electrozone, one medicinal, which he had prepared for dental use, and the other for general disinfecting purposes.

Dr. Harlan : The only answer I can give is, that the electrozone that I have used is a non-coagulator of albumen. The process of manufacture of electrozone would tend to show that it was not a coagulator. It was not intended to be, and if it gains any reputation in dentistry it must gain it on the fact that it does not coagulate albumen. I thank you sincerely for your patience and courtesy this evening.—*Dental Cosmos.*

AMERICAN MICROSCOPICAL SOCIETY SCORED.

We are to-day (March 18th) in receipt of "Part I., October, 1894." of this publication which the cover-page informs us is "Issued Quarterly," and by virtue of which it is transmitted through the mails as second-class matter. It contains pages 1–67 and eight plates, price 50 cents.

From it we get the first official echo of the Brooklyn meeting held last August. If it takes seven months to issue Part I., when may we expect parts II., III., IV. ? The contents of this brochure are as follows :

Pages 1–17, the secretary's minutes of the sessions.

Page 18, the treasurer's report for 1893–94.

Pages 19–64, Kingsbury's paper on the Histology of the enteron of N. maculatus. (This is the paper of which we published a synopsis last November, pp. 339–345).

Pages 65–67, Miss Claypole's method of securing paraffin sections. (We reprint this in full under our head of "Methods," pages 119–122.)

As these two papers and the treasurer's report were read at the meeting, we infer that the principal cause of seven months' delay was the writing out of the secretary's notes. And yet any competent secretary ought to be able to do this in from seven to seventeen hours. These notes are padded with six pages regarding a new form of microscope and regarding bacteriological work in the Hoagland laboratory—matter entirely out of place in the minutes of the meeting. Both items would more properly appear as short papers by the respective authors.

On the first page, Dr. Lester A. Curtis gets the following compliment : "It is usual for the volume to begin with the annual address of the president, but the secretary has never received it, although he has written repeatedly to the president for it."

It will be remembered that the meeting was to begin on Monday morning, August 13th, and that the president did not arrive until Tuesday morning. The evening of the first day is the proper time for the delivery of the address, which once was an occasion of some importance. We have searched these minutes in vain to learn whether or not Dr. Curtis delivered any address at all! Evidently he did not, but that the secretary tried to get a posthumous address out of him and failed—failing, he utters the above-quoted howl. Had the Ms been torthcoming, the secretary would have published it, and the world would innocently have supposed that Dr. Curtis delivered it. This reminds us of the way newspaper reporters write up events that do not occur. Is it quite scientific?

But how came this Dr. Curtis, of whom we confess never to have heard, to be president of this great American institution? What has he done in the realm of microscopy that entitled him to this distinction, for be it remembered that the fact of being president of the American Society has heretofore insured the incumbent an honorable election to membership in the Royal Microscopical Society of England. The only answer we can find is on page 9 of the brochure before us, as follows:

"The report of the executive committee with respect to the prizes which the society was enabled to offer by the liberality of its president, Dr. Lester A. Curtis, was then read."

These prizes, amounting to $125, were provided for in August, 1893, at which time Dr. Curtis was elected president. It is fair to say that but for the prize papers of Wiegand, Kingsbury, Krauss and Claypole, one of which constitutes more than two-thirds of this brochure, therew ould not have been a reasonable excuse for continuing the "Proceedings" this year. But is it, in view of the outcome, too much, to guess that the little coterie of members at Madison, in 1893, unwittingly sold out the presidency for $125? Will the Royal Microscopical Society sell a membership for that consideration and not get the money, either? We shall be interested to see the outcome. If any of the gentlemen who at Madison elected Dr. Curtis and accepted his prize-money wish to explain this transaction, these columns will be at their service in which to do so. We would not for a moment do him any injustice.

But about these prizes. Wiegand, Kingsbury and Miss Claypole, if we mistake not, were all students at Ithaca. Kingsbury says that his prize-paper did double duty, having been "presented to the faculty of Cornell University for the degree of M. S. in June, 1894," in the preparation of which he says he was assisted by "the suggestions and advice of Professor Gage throughout this investigation." The university gave him M. S. and the society gave him $50 of Dr. Curtis' contribution. The three Ithaca students got $110 out of the $125. There were but three of the unsuccessful competitors, and whether they were Ithaca students or not we do not know.

If these prizes were offered for investigations to be made "under the suggestions and advice" of college professors, then we congratulate Professor Gage upon his connection therewith ; but we ask why in the world did not the secretary see to it that all the colleges had the knowledge which should enable them to enter the contest ? If Dr. Curtis wanted to see his prizes fairly competed for, why did he not insure an effort for them in some of the other 150 American colleges ? Again we offer these columns to the secretary and to Dr. Curtis in which to explain what safeguards they established to prove this a full, fair, open contest.

As this Journal goes into over a hundred colleges, we ask the subscribers in each one to report whether or nor they had full and fair warning that their students might compete for these prizes and be assisted "by the suggestions and advice" of their professors. We offer to publish every affirmative reply.

In another column will be found the announcement in full for the 1895 meeting. As will appear from the foregoing, the society has more to expect from Ithaca than from any other quarter. The selection is wise. It would have been infinite folly to have followed the A. A. A. S. to Springfield, Mass., for there is not to our knowledge a microscopist in that city. The Ithaca people seem determined to have a good meeting next August. We shall keep you posted upon the outlook each month. In order that there be no trouble about the secretary having Professor Gage's address, we request that he send it to us in advance of the meeting. We will have it all in type and ready to distribute in our August number the moment he has finished reading it.

But how about prizes this year ? Give us the facts, please.—EDITORIAL, *American Monthly Microscopical Journal.*

THE FAUNA OF DEAD BODIES.

M. Megnin has recently published an interesting work, constituting a volume of the Encyclopédie Scientifique, in which he has described the wonderful manner in which he terms "the workers of death" reduce the body to dust. He has demonstrated again what has long been known, that putrefaction is accomplished by the aid of microbes and small insects of different species. His effort has been to show the exact order in which these microbes and insects attack the decaying body.

According to M. Megnin, insects are attracted, even from a great distance, by the odorous gases emitted by the decomposing body. These odors indicate to the several species of insects, the stage of putrefaction which has arrived, and thus enable them to judge, individually, whether or not the soil has been properly prepared for their development. M. Megnin describes seven stages of decay, each of which is characterized by specific organisms which are so constantly and definitely associated with definite stages of the putrefactive process that the length of time which may have elapsed since the death of the animal or person may be very accurately estimated by careful determination of the character of the microbes and insects present. In this respect, the observations of the author must take an important place in medical jurisprudence, for not infrequently the question of the length of time which has elapsed since death, is a very important and puzzling one, and one for the solution of which the data have hitherto been quite insufficient.—*Modern Medicine.*

THE ELEMENT OF ELIMINATION AND ASSIMILATION IN PUS-FORMATION.

At the late annual meeting of the Erie Railway Surgeons of Niagara Falls, in the discussion on the treatment of pathological conditions of the peritoneum, Professor Roswell Park, of Buffalo, dwelt at considerable length on the importance of attending closely to the organs of elimination in all cases, operative and non-operative, of the abdomen, and stated that in not an inconsiderable number we might, by stimulating the emunctories into increased activity, dispense with radical surgical measures entirely.

There can be no doubt in my mind now, after twenty years practice, but, that of late years, since the germ theory has taken such a hold on the profession, and all the intricacies of disease are supposed to vanish under the objective glass of the microscope, this latent function of all the excreting organs in neutralizing and throwing off the lethal elements of disease, has not received the attention which its importance merits. When one, accidentally or otherwise, swallows a poison, nature promptly commences the work of elimination by emeses, purging or diaphoresis. The usual onset of all serious maladies is marked by similar phenomena.

Pathologists are not in accord on the question of elimination of pus by the absorbents; some maintaining that suppuration can occur only through the intervention of germs, and hence its mechanical evacuation is, under all circumstances, imperative. Others, on the contrary, recognize pus as often a non-septic product, producible, by both mechanical and chemical agents; infection acting only in occasional instances, and, even under these circumstances, the chemistry of the economy may destroy it. This latter view, no doubt, is the correct one, for the calcareous, or inspissated masses of foci, which we often find in the lungs, on autopsy, in unmistakable terms, proves its validity. There can indeed be no longer any question but that small isolated, purulent collections may become rapidly encapsulated, disintegrated and obliterated by vital action alone.

Professor Charles Heitzman, of New York, has repeatedly demonstrated, that by the simple expedient of adding an alkali to purulnent urine it is at once transformed into a ropy, myxomatous mass. This hint should not be lost sight of, under a thousand circumstances, when we wish to transmute a localized purulent collection into a substance, at once, inert and readily taken up by the circulation, without detriment to health. In order, however, for us to fully dispose of a purulent collection, all the emunctories should be called into action. The temperature-wave will indicate when the work is done and all danger of toxæmia is past. But, in order for us to derive the greatest advantage through this provision of the economy, the glands must be fed with fresh, invigorating blood; which means, that the functions of assimilation should not be overlooked, that our patient's general nutrition must be well supported, and that he must have tonic, reconstructive treatment.

In order to realize anything like satisfactory results in the treatment of any description of severe injuries or local affections, it is more important to direct our attention to the stomach than the lesion. My own experience induces me to place beef-tea in the very front rank as an aliment—the best tolerated and most strengthening. Next comes infant's food, milk, which has been greatly overestimated as a permanent aliment. Along with nutritious diet, stimulants, tonics and reconstructive remedies should be employed. Alcohol in certain forms may be utilized with advantage. Quinine, iron and other hæmatic medicines should not be neglected.

Of late, my experience in a considerable number of cases, in which I have used maltine with coca wine, has been most gratifying. It embodies the tonic action of coca, besides the digestive and food properties of maltine. It goes without saying, that proper covering of the body, pure water, and proper ventilation, with care, are all essential. Let us then give nature a chance and not be too ready to operate, when as much and more can often be accomplished by a rational, constitutional therapy. Malnutrition constitutes the pathological foundation of the greater number of diseased states, therefore, *curationes morborum causam demonstrant.*—Manley (T. H.), *International Journal of Surgery.*

TIN—AND—GOLD IN LOW GRADE TEETH.

Dr. J W. Canaday, Albany, N. Y., demonstrated the method of preparing and condensing tin and gold when used in combination as a filling for simple cavities, emphasizing its value for young and poorly-calcified teeth.

In preparing the filling-material, care is necessary to employ equal *weights* of each metal. For convenience in use a sheet of No. 4 gold is taken, and on this a sheet of No. 4 tin is laid ; these are once folded, making a half-sheet in size, again folded to one-quarter sheet size, and this finally folded on itself.

The foil is then cut in strips of a width suited to the size of cavity to be filled. Strips of the combination of metals are preferred to ropes, as permitting more thorough condensation. Cavities are prepared as for soft gold fillings. Strips of the tin and gold, as folded, are introduced in the cavities by means of suitably-shaped hand-pluggers, beginning at the distal portion of the cavity and folding the foil as the filling progresses, so that a suitable excess is allowed for final surface condedsation, which is effected by means of a broad-faced plugger-point followed by a steel burnisher rotated in the engine. The burnisher first employed is the largest that is permitted by the size of cavity filled, and is applied to the center of the filling, drawing it toward the margins. The filling is finished by the ordinary plug-finishing burs in the engine, a final burnishing completing the work.

Advantages claimed are : Ease and rapidity of manipulation, admitting of the use of tin and gold in mouths of the youngest patients ; permanence, the resultant filling becoming in time equal to a good amalgam in hardness ; and freedom from wasting of the filling so commonly found when amalgam is employed in cavities in soft teeth.

When properly employed, tin and gold will not cause staining of tooth-structure, makes a perfect guard for gold at the cervical portion of cavities in approximal fillings, and safely and completely guards cavities in permanent molars and bicuspids till their calcification is completed —*Dental Cosmos.*

EXPERIMENTS UPON SALIVARY DIGESTION.

Within the last few weeks, a large number of experiments have been made in the laboratory in relation to salivary digestion. These experiments have been of two classes :—

1. A series of experiments to determine the effect of saliva upon starch under different conditions, relating chiefly to the admixture of other food substances, particularly acids ; and—

2. The degree of completeness of the conversion of soluble starch into maltose, as shown by a quantitative estimation of the amount of maltose and of the unconverted starch and dextrine present in the stomach fluid obtained after a test meal of bread and water.

In experiments for the purpose of determining the influence of acid upon the starch activity of saliva upon starch, the method employed was essentially that of Dr. William Roberts. Ten c.c. of a 1 per cent. solution of starch were added to 90 c.c. of distilled water at a temperature of 100°, to which mixture 1 c.c. of the saliva was added. The time for complete conversion of the starch by normal saliva we found, as did Dr. Roberts, to be four minutes. In determining the effect of the various substances added, a definite amount of the substance was dissolved in a mixture of starch and distilled water before the saliva was added, the other conditions remaining the same. The effect of the substances in hindering starch digestion is indicated by the length of time required for complete conversion :—

Oxalic acid:	Time.
1–10,000	No action.
1–15,000	35 minutes.
1–20,000	19 “
1–30,000	4 “
Lemon juice :	
1–200	No action.
1–500	42 minutes.
1–2,000	9 “
1–5,000	7 “
Orange juice :	
1–200	11 “
1–500	4 “
Apple juice :	
1–50	45 “
1–200	4 “
Vinegar :	
1–200	No action.

1–500	40 minutes.
Hydrochloric acid :	
1–4,000	No action.

Experiments were also made for the purpose of determining comparatively the influence of the same substances upon the action of malt diastase upon starch. The preparation of diastase used was a malt extract, 1 c.c. of which was capable of completely converting .1 gram of starch in two minutes. The following were the results :—

Oxalic acid :	Time.
1–2,000	No action.
1–5,000	5 minutes.
1–10,000	2 “
Lemon juice :	
1–10	No action.
1–200	2 minutes.
Apple juice :	
1–10	2 minutes.
Vinegar :	
1–10	10 minutes.
1–20c	2 “
Hydrochloric acid :	
1–4,000	No action.
Lactic acid :	
1–200	No action.
1–2,000	5 minutes.

Several points of interest may be deduced from these experiments. A few only may be briefly mentioned :—

1. Acids of all kinds inhibit the diastatic action of both saliva and malt, but human saliva is very much more susceptible to the inhibitory action of acids than is malt.

2. The normal degree of acidity of the gastric juice; namely, 1 part to 4,000, or .025 grams of free hydrochloric acid per 100 c.c. of stomach fluid, is sufficient to completely inhibit the action of both saliva and malt extract. This fact is worthy of notice for the reason that certain manufacturers of malt preparations claim that the fluids in the stomach have no action upon diastase ; a statement which evidently does not stand the test of scientific investigation.

3. Oxalic acid and vinegar are so strongly inhibitory of salivary digestion that they are wholly unfit to be taken with food.

4. The greatly less, yet distinct, action of the acids of sour fruits in hindering the action of saliva upon starch, explains the reason why many persons with weak digestion are unable to take acid fruits in connection with farinaceous foods.—*Modern Medicine.*

VALUE OF MEDICINAL PEROXIDE OF HYDROGEN PREPARATIONS FOUND IN THE MARKET.

In the article in question the writer says, a standard solution of medicinal $H_2 O_2$ should respond to the following tests :

1. It should contain at least 15 volumes of available oxygen.
2. The quantity of free acids contained in 100 cubic centimetres should require not less than 1 c. c. and not more than 3 c. c. of normal volumetric soda solution, to be made neutral. Such a small quantity of free acid is not objectionable.
3. It should not contain any soluble baryta salts.
4. It must be free from sediment.

The different brands found on the market being submitted to these tests gave the following results :

BRANDS.	Volume of Available Oxygen determined by means of a solution containing 5.665 Grammes of Permanganate of Potash per liter of distilled water.	Residue obtained from 100 C. C. of Peroxide of Hydrogen dried at 120 degrees C.	Acidity expressed in Cubic centimeters of Normal Volumetric Soda Solution for 100 C. C. of Peroxide.	Baryta found in Soluble Baryta Salts contained in 100 C. C. of Peroxide.
No. 1. John Bene's H_2O_2 (Medicinal)	10.50	0.1886	2.19	None
No. 2 Hydrozone........	27.35	0.2180	3.11	"
No. 3. Larkin & Scheffer's H_2O_2 (Medicinal)	9.65	0.1206	6.75	"
No. 4. Mallinckrodt's " "	9.55	0.1408	1.43	"
No. 5. Marchand's " "	16.55	0.564	1.29	"
No. 6. McKesson & Robbins' " "	10.95	0.0540	0.44	"
No. 7. Merck & Co.'s " "	0.50	0.2418	4.57	"
No. 8. Oakland Chem'l Co.'s " "	10.50	0.0382	0.34	0.0017
No. 9. Peuchot's " "	10.60	0.4674	1.77	0.0018
No. 10. Powers & Weightman's " "	8.40	0.0830	2.03	None
No. 11. Pyrozone, 3 per cent. " "	11.20	0.0534	0.76	"
No. 12. Rosengarten & Son's " "	3.10	0.1002	0.25	"
No. 13. Smith, Kline & French Co.'s " "	6.15	0.0880	2.6	"
No. 14. E. R. Squibb's " "	12.40	1.004	12.04	"

By referring to this table, it is easily noticed that brands No. 7 and No. 12 are valueless.

The brands No. 8 and No. 9 are not fit for medicinal uses, owing to the fact that they contain traces of soluble baryta salts.

The brand No. 3 has a heavy sediment of sulphate of baryta, which may be considered inert towards the system, but it is certainly detrimental to the keeping qualities of this preparation.

Brand No. 14, which is sold as a ten volume solution, is really twelve volumes, but it is too acid.

Brand No. 5, which is sold as a fifteen volume solution, is really 16.55 volumes, viz.: About 10 per cent. above the standard.

The brand No. 2, which is sold without any mention of volume, is really a 27.35 volume solution, viz.: Ninety per cent. above the standard.

None of the other brands come up to the standard, but on the contrary they run from 35 to 55 per cent. below.—ENDEMANN (H), *Times and Register*, Philadelphia.

SOCIETIES.

THE DENTAL SOCIETY OF THE STATE OF NEW YORK.

The 27th annual meeting will be held at Albany, May 8 and 9.

The subject for the meeting will be "GREEN-STAIN."

"THE ETIOLOGY"—Illustrated with lantern slides, etc., by
Carl Theodore Gramm, M. D., Chicago, Ill.

"THE CLASSIFICATION," W. C. Barrett, M. D , D. D. S., Buffalo, N. Y.

"THE THERAPEUTICS," S. B. Palmer, M. D. S., Syracuse, N. Y.

The Board of Censors will meet on Tuesday, the 7th, to examine candidates for the degree of M. D. S.

"The Kenmore" has been designated as headquarters.

According to reports, the March meeting of the 1st district dental society was a grand success.

The Hayden Dental Society, of Chicago, enjoyed its third annual banquet the 21st of January. The feature of the meeting following was the address by Dr. T. E. Powell. This is one of the "monthly meeting" societies, and it issues its program complete for the year.

The annual meeting of the VIIth district society of this state was first called for April 30th, but the discovery was made almost immediately that this would clash with the commencement exercises of the Dental Department of the University of Buffalo, so a new set of cards was made out and mailed, changing the date of meeting to the 23d. "Doctors' Day" at Buffalo seems to have the call.

April 16th is the time set by the New York Odontological for the discussion of the American Dental Association's questions, numbers I and II. The former, "Which method of root-filling furnishes the most complete obliteration of this space?" to be opened by Dr. Perry; the latter, "What is the surest treatment to secure root-canal sterilization?" by Dr. Jarvie. Ten minutes to each member ought to bring out methods galore.

The thirty-first annual meeting of the Illinois State Dental Society will be held at Galesburg, May 14 to 17, inclusive. An interesting program is in course of preparation. All dentists practicing in Illinois are especially invited to attend. A cordial invitation is extended to the profession generally. This will be the first meeting in Galesburg since 1876, and it is the hope of the officers that it will be one of the most profitable meetings in the history of the society.

COLLEGES.

The Kansas City Dental College held its thirteenth annual commencement March 1st. The usual banquet closed the exercises.

The Dental Department of the University of Buffalo will graduate its first class of three year students, April 30th. It numbers about thirty and includes a young lady who is destined to make herself a name and place in local practice. The exercises begin at nine o'clock with the public examination before and by the curators. This occupies the whole of the morning and a part of the afternoon. At midday a lunch will be served, in the evening the graduating exercises at Music Hall, and well on toward midnight will come the banquet.

The Kansas City Dental College has issued the following circular letter :

Your attention is directed to the following resolution which was adopted at the last meeting of the National Board of Dental Examiners held at Old Point Comfort.

" *Resolved*, That it is the sense of this body that the Kansas City College of Dental Surgery is not only not worthy of recognition, but that we have conclusive evidence that it is a fraudulent concern ; and further, we would warn the public to be on their guard, because of the similarity of title of a reputable school of the same city."

The officers of the Kansas City Dental College are receiving many complaints from their Alumni and others, who send proof that students in attendance at this "Kansas City College of Dental Surgery," taking advantage of the similarity in name, advertise that they are attending the Kansas City Dental College, thereby trading upon the well earned reputation of that institution, and committing a fraud upon the people.

The earnest attention of all Boards of Examiners in the various

States is called to this, and everyone interested in fair dealing asked not to confound the old Kansas City Dental College with the Kansas City College of Dental Surgery run by "J. T. Atkinson, Sec'y."

The projectors of this so called college acknowledge that they selected a name similar to the Kansas City Dental College, for the purpose of making confusion of identity, they having nothing to lose and everything to gain by such an act.

We ask all interested in the profession to be on their guard against the deception being practiced.

Boards of Examiners who have in charge the decision as to the reputability of schools and diplomas are especially cautioned not to give credit to degrees from the Kansas City College of Dental Surgery, under the impression that they are from the Kansas City Dental College.

PELLETS.

The dentist had merely touched the gum with his bur when the patient warned him with,—"Doctor, you're on the grass."

"Chew Century Foil," so conspicuously posted at railway stations and other places throughout the country, has no reference whatever to the article manufactured by the White company. That may be a "good thing," but the inexperienced had better "push it along."

The Buffalo *Medical Journal* will soon be fifty years old. It proposes to signalize its semi-centennial anniversary by increasing its reading pages from 64 to 80, and by making other improvements that will contribute to its efficiency and keep it abreast of the professional progress of the period.

The White company has settled the cocain nostrum business for all time, and there is no longer any excuse for investing in local anesthetics whose very names are as nauseating as their ingredients are ignorantly compounded. Dr. Kirk's formula is now common property, and the dentist may have it prepared by his own druggist, or obtain it ready for use of dental dealers. The latter course is to be preferred for obvious reasons.

The Executive Committee requests that all who desire copies of the souveinir volume of the meeting held at Philadelphia December 11, 1894, in celebration of the fiftieth anniversary of the discovery of anesthesia by Horace Wells, will promptly forward their names to the chairman, in order that the number of copies to be printed may be determined upon. The price has been fixed at $1 50 per volume, postage free to all parts of the United States; foreign countries at regular postal rates.

Agents for supply houses are generally a gentlemanly set of fellows, but like other good people they have in their ranks a number who do them no credit and the houses they affect to represent much harm. Dentists who have any sense of the proprieties, to the extent at least of decency, do not care to be called upon by walking gin-mills whose bleared eyes and pole cat breath tells altogether too plainly of a bum, if not debauch the night before. The man who cannot keep sober long enough to sell goods is unfit to go on the road, and the supply houses represented by that kind of men need trouble themselves very little to find out at least one reason for poor sales.

BOOKS.

STANDARD DICTIONARY OF THE ENGLISH LANGUAGE. In two volumes. New York: Funk and Wagnalls Company.

The second volume of the two-volume edition of this splendid work is at hand, and that something like justice may be done it, we condense from the New York *Sun*, of April 14th, expert opinion as to its value:

The publication in question having appeared considerably later than the two works with which alone it invites comparison, the Century and the International, ought to be superior to them in some respects, and this it unquestionably is. We shall here glance at it mainly from the viewpoints of the vocabulary, the definitions, and the pronunciation, although on other accounts the book deserves careful examination and high praise, especially as regards the appendices.

As regards the vocabulary, which is the primary point to be considered, this dictionary far surpasses any of its rivals. The full number of vocabulary terms in Worcester is 105,000; in the Webster International, 125,000; in the six volumes of the Century, 225,000; in the Standard, 301,865, exclusive of the appendices, which contain 47,468 entries. At the same time it is to be noted that care has been exercised to avoid the recognition of needless new terms. A committee of representative scholars has passed upon new literary words before they were admitted. Then, again, the judgment of scientific specialists has determined the admission or rejection of technical terms, and, upon their decision, not a few technical terms recorded in other dictionaries have been rejected, some because they are obsolete, and others because they are so rarely used as to be comparatively valueless. This simple general rule of inclusion has been followed: Omit no word found in a living book, that is, a book read by a considerable number of persons, and whose meaning is likely to be sought for in an English dictionary.

This dictionary contains more synonymes than any other, and is the first to introduce the system of explanation by autonymes. We should also point out that the source of the quotations used to verify and illustrate the meanings of words has been so indicated that it can be easily found. Stock dictionary quotations have been discarded with few exceptions, and this because other quotations that serve the purpose as well or better have been found. This is a distinct gain to the student of words, and we can well believe that it has been a herculean task to select, locate, and verify the thousands of quotations used in the work before us.

The treatment of synonymes and autonymes is a characteristic feature of this dictionary. In this part of their work, the editors have kept in view the fact on which Dr. Hugh Blair laid stress more than a century ago: "Hardly in any language are there two words that convey precisely the same idea. As they are like different shades of the same color, an accurate writer can employ them to great advantage by using them so as to heighten and to finish the picture which he gives us But, in order to do this, he must be extremely attentive to the choice which he makes of them. The Standard alone gives autonymes. It is obvious that autonymes have the merit of definition by contrast, the meaning of a word often being made clearer by the sharp statement of what it is not.

We pass to a subject which has given much trouble to the makers of dictionaries. the method, namely, of compounding words. The authors of the book before us maintain that, for the first time, an attempt has been made to reduce the compounding of words to a scientific system. Not that they have attempted to secure absolute consistency with reference to all complex terms in the language. Such an attempt would be sure to fail, but there are many thousands of word-pairs in common use which are amenable to rule in regard to form, and for each of which some one form must be the best.

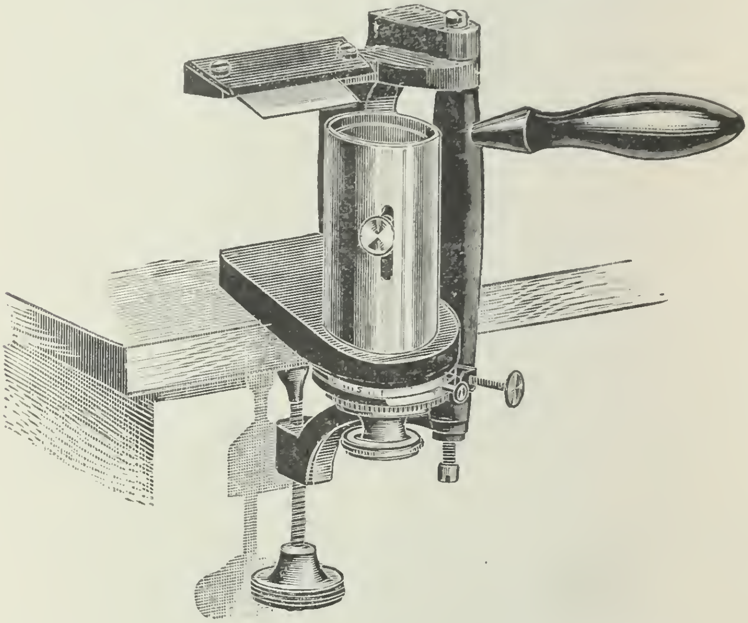
In this dictionary the etymology is placed after the definition. We are wisely reminded that many persons are confused and discouraged when the signs and abbreviations, and the foreign and other strange words that make up the etymology stand between the vocabulary word and its definition. It is within bounds to say that not once in a hundred times, when a dictionary is consulted, is the etymology studied. Unquestionably, for the student, the etymology throws light upon the meaning of the word, but only a few are students, and these will easily find the etymology, wherever it may be placed. The scholar, however, is by no means neglected, and great care has been taken to have the etymology adequate.

The editors have accepted and applied the so-called scientific alphabet prepared and promulgated by the American Philological Association. This scientific alphabet, or alphabet of least resistance, is used in the respelling of the pronunciation for vocabulary words, and represents undoubtedly a great advance.

One of the most praiseworthy features, is the appendix in which all proper names are arranged in one alphabetical order. If one wishes to know the meaning or pronunciation of a proper name, and is not sure whether it is a name in geography, history, fiction, mythology, biography, or bibliography, he will not be required to consult separate glossaries, but by simply turning to the one alphabetical order he will find the word, the pronunciation, and meaning, and will learn there whether it is a name in history, fiction, etc.

Another valuable adjunct is the glossary of foreign expressions. This is a defining vocabulary of quoted sayings and phrases from the Latin, French, Italian, German, Spanish, and Greek. The glossary here presented is much the most extensive hitherto made.

LOW PRICED MICROTOME.



In devising this microtome the Gundlach Optical Company, Rochester, has departed from the old method of a sliding instrument, and endeavored to perfect an instrument easy of manipulation, simple of construction, effective in operation, and at low cost. An examination will show that they have not only accomplished all they set out to accomplish, but more, as the microtome has advantages over any other cheap instrument in the market, and, in fact, over most of the high-priced ones. The principle advantage claimed is that the microtome has an automatic feed.

The instrument is arranged for clamping to an ordinary table. The feed is automatic, has a graduated scale, and will cut sections from about one two-thousand-five-hundreth to the two-hundred-and-fiftieth of an inch, or to put it more accurately, from the one-tenth to one-hundredth of a millimeter. The feed has a stop screw, and each graduation represents the one-hundredth part of a millimeter. A little screw is arranged to raise the pawl out of the ratchet wheel, so that after the feed screw has reached its greatest height it can be rapidly returned. The knife is made of the very best steel and has the finest temper. It is a very efficient piece of apparatus, and sells for the low price of $16.00.

THE
ODONTOGRAPHIC JOURNAL

VOL. XVI. *July*, 1895. NO. 2.

SUGGESTIONS TO THE BEGINNER IN PRACTICE.

BY CYRUS A. ALLEN, D.D. S., PROFESSOR OF PROSTHETIC DENTISTRY,
UNIVERSITY OF BUFFALO.

It is rare that a class while in pursuit of special knowledge finds it to its interest to look backward; but to-day we have presented the unusual spectacle of an invitation extended to a chair which you passed one year ago to speak to you on matters of practice. The speaker keenly appreciates the compliment thus paid, and particularly as you and he began the study of Prosthetic Dentistry together, in a measure. The work of instruction was as new to him as the work itself to you, and the fact that your treatment was always so courtious, no matter how loudly his heart thumped and his brain whirled, gives him double pleasure in meeting you once more before you turn another page of life's book.

Your work in study has been long and hard, and I can well understand that you need a rest. Why, then, before opening an office should you not take a little vacation wherever it may be possible. Two years from now you would not know the difference *financially*, but you might *physically*. To be sure the world is waiting for you; but if so, she can hold out a few weeks longer, when you will be in all the better shape to polish her off to her benefit and your profit. This conceeded, let me help you answer the question of the hour, one that has worried you not a little ever since commencement day, because to you is more than prospective fact:

How shall we most successfully build up a practice? In the selection of offices consider local conditions In any event seek the best obtainable. If you decide upon a residence location, boldly assert your rights to recognition by hanging out your professional plate or sign from a house of unquestionable character, and directly in the midst of the people whom you wish to attract. If local circumstances and conditions suggest that you establish in an office building, select for this purpose the very best the town or city affords.

A word in regard to the offices themselves. Personally, I prefer the southern and eastern exposure. At first thought you may imagine that such an exposure would be undesirable on account of sun. Let me confide to you that I know of no more welcome visitor to my office than the cheering health-giving rays of old Sol. Full practice makes a slave of you, and the slave who daily toils with only the light of a north window is always the one to come out "spring poor," with colorless cheeks and failing energies. Let the sun in upon you whenever possible, and my word for it you will be more genial in spirit and better in body. Your office is to be very largely your home; then make it as cheerful and attractive as possible. Do this with two motives: First,—Because you yourselves deserve to have cheerful and attractive surroundings; for unless your early days of practice are more fruitful financially than most men can boast of, your patience may be put to many a sore test. Second,—Your surroundings should be attractive for the benefit to you of their influence on your early patrons.

It is an undoubted fact that there is an ineffacable memory of effect made upon the mind of any man, and especially woman, when he enters an office for the first time. If the whole air of the place be one of neatness and refinement he congratulates himself mentally that he has entree to your establishment. This will be true only in case the neatness and refinement of your professional home be in harmony with the character of your visitor. And here is another factor of strength for my argument; for if your caller be not of your kind, and one who is not happy and pleased in refined environments he will surely not aid you in securing the people whom you want. In other words, like attracts like. This home of yours should be cared for by a maid, cleanly in appearance, of good address, active to your interests—and not *too* good looking This adorable gift of nature to woman has caused no end of trouble to mankind since the world's creation, but without further suggestion in this line we will pass to your own personal appearance. Above all professions it is demanded by an exacting community that the dentist be neat in person and clean in habit. Too much attention can not be given to the end that your linen be always fresh, that your coats be clean and spotless, that your hands be free from soil or stain. To the student in his early work these may seem exacting or even impossible conditions. Working in limited space, surrounded by all the rush and hurry of your companions, and using tools, each one of which has legs to walk away with, I grant, make the suggestions a little difficult to follow out. But in your well appointed office many of these conditions will be changed and the difficult in college days will be made easy in practice. You should also remember that clean faces are as valuable to your personal attractiveness as spotless linen. Nature is prodigal in her ways and from most of us the barber should receive his fee each morning before we enter on the day's engagements. Your clothing should always have your careful attention. Employ tailors of your own relative professional standing. This will ensure a presentable personal draping for all occasions. Avoid loud or conspicuous patterns and be sure to have clean and well brushed garments whatever you may wear. To my mind a man is never so elegantly presentable as when he is quietly but richly dressed. Avoid all conspicuous display of jewelry. You should never lose sight of the fact that the dentist is discussed more than any other adjunct to the family welfare. Immediately upon your being employed by one member of a family, *all* will feel priviledged to canvass your merits and personal attractiveness. How obvious then the necessity of making an impression which will reflect credit and thus bring others to your doors.

Do not allow your office to become in any manner a lounging place for your friends. There are many well intentioned people in this world who have no perception of the fitness of things. You will need to handle this class with much discretion, but you can make them so comfortable in their reception and their departure that they will never suspect how you excused yourself and they departed. If you have any tendencies toward gaiety or frivolity do not permit their demonstration *in your office*, for if you do, you surely will some time be mortified by being discovered by your favorite family.

Your greatest tact and skill may at times be required in ridding your office of the "never get throughs," and I am pained to say these people are always women. They unconsciously run on, and on, telling you of baby's cutting the last tooth, the other children having measles, and if not suppressed your poor ears will ring with a beautifully pictured rehearsal of madam's last warfare with cook or maid. You are expected to look pleasant during all this, but if your wits are at work, which, fortunately the star actor can not read your "finesse" will be so *adroitly* managed that your door will be opened and the woman without a period in her vocabulary will find herself bowed out with such elegance that she will delight to speak of your polish to her friends.

I would caution you always to "head off" any tendency toward exchange of confidences with your patients. Never allow your curiosity to permit of any gossip. The world is full of regrets and grievances, and should you give silent consent to their hearing, you may have little time for anything else. You are not *clothed properly* to receive and minister to the world's woes. Whenever a burst of confidence comes, or is imminent, turn it away by some adroit pleasantry. In the heat of passion or pique some one may say things to you, if allowed, which might be regretted, and if regretted, that person would forever hate you for knowing her troubles.

Idleness is a highwayman who not only robs you of the profit of the present time, but also one who builds up about you the strength of habit so firmly that it becomes impregnerable. Manage, then, to have occupation for yourselves at all times, no matter whether it be of mind or hand, the result will be the same.

You should always display the fact that every instrument used in an operation is laid aside for disinfection before being returned to its place in the cabinet. In this matter all ostentation should be avoided. Simply *allow* by inference, perhaps, the patient to know this. In this line we might go even to the end of saying that you should never use the same piece of rubber dam *twice*, not even on the *same patient*. In any event, if you do use it more than once be discreet enough not to allow your patient to know it. Receive all patients when they call upon you with a *genial dignity*. All tendencies leading toward sycophancy are beneath your indulgence. Do not lose sight of the fact that possessed with a graduation diploma from this institution, you are the peer of all men, and in no manner need to cringe to even the highest. The fact that families of prominence seek your skill should be sufficient to you. Do not understand me that I would counsel brusqueness of manner. On the contrary, I counsel you to always be elegant in your bearing toward *even the humblest.*

Your treatment of children demands the most exacting care and patience. These little people have highly endowed mental and physical organisms, and universally come to you with a long chapter of dental horrors fresh in their minds, recited to them by some silly and soulless persons who should have had more humanity in them than to have caused this terrible apprehension. Your efforts must be first directed toward gaining the child's confidence. With his confidence will come his love and then you are practically master of the situation. To gain this confidence all your tact will be required and as an *infalliable law* let me say to you that deception must *never be practiced.* Do it but once and the child never again trusts you. Whenever it may be necessary to inflict pain prepare the little one for it, with some kindly spoken word of encouragement and the assurance that it will be but a moment and always sacrifice *thoroughness* to retention of confidence. Whenever a child shows extreme nervousness, and a disposition to lean upon the mother, arrange by well timed pantomimic or spoken language to have the little patient left alone in the operating room with you. There and then only can you put him on his own feet with kindly words and little pleasantries and you two will get on well together. But should Mama remain it would be only a repetition of "Please, darling, let the Doctor do this, then it won't hurt any more." Deliver me from such demoralization in practice among children Every young practice is largely built upon work among children. The older members of the community are already settled upon their dentist. By the adroit and skillful handling of a child you will see entire families seeking you. *I had rather have the love and confidence of one child than the friendly speech of a dozen adults.* All appointments should be met with promptness, allowing only stern necessity as an excuse for failure on your part. No matter whether it be an appointment with rich or poor, let your manner and treatment be the same, *always eourteous and professional.*

Now we come naturally to the business phase of our profession. Immediately upon settling in any town or city for practice you should open an account at some discount bank. As you are nearing the close of your college work and think of your depleted pocketbooks, a bank account may strike you as a *paradox*, and I confess to you that after fifteen years in practice my own account is often in just this condition. The reasons, however, for this advice are two fold: First, an open account at a bank will stimulate you to economy and saving. If this habit is carefully matured you will soon find yourselves with a handsome sum to your credit, which may be very convenient for use during your bridal journey and the final settling of your domestic establishment.

My second reason for having a bank account is that it brings you in close touch with the strong men of the community, and you may at some time desire to use the bank for your own convenience. Should you ever find it necessary to borrow upon your paper, let nothing prevent your appearing upon the day your note falls due, and *either pay or arrange for a renewal.* Above all, do not permit your credit to be injured by carelessly allowing your note to go to protest. Meet all obligations promptly; for you should remember that the "*ready paymaster is always master of another man's purse.*" The young practitioner will be often sought by the "bargain" seekers, and don't forget that these people are very adroit in driving a bargain. Make your fees uniform to all. Do not allow pressing needs to place too low a value on your skill. It remains with you entirely to be known as a two-priced man, a *cheap man*, or one who knows the value of his services and has the character to demand compensation for them. Do not allow yourselves to be beset with the fear that you may be spoken of as a "high-priced" man. You are not in dentistry for your health, and the moment that you become known as the high-priced dentist in the community, that moment will your appointment book be filled with the names of that community's richest citizens.

Give sittings in your early practice only by appointment, no matter how loudly your necessities may be clamoring. I advise this for the benefit of its reflective influence, conveying the idea as it does, that you are engaged at the time of the call. Have appointment cards, plainly stating date of appointment. For broken appointments you should always make charge for your time, except where sufficient excuse may be presented. You will be obliged to make this charge for your own protection. All the anxieties which you may have in this direction will be over women. Business men are always faithful to their arrangements and truthful in statements. Unfortunately, this can not be said of all women. They do not realize the importance of an engagement, and if for any trival reason, such as a caller, a new Easter bonnet, etc., they will find it easy to offer some plausible excuse for ther detention. You can most effectually break up any such tendency of your patients by simply stating that "it is all right so far as you are concerned, as you have already made a charge for the loss of time." It works like magic. You will have no more disappointments from that source. Be dignified in the demand for your rights and with it will come the respect and confidence of the patient. In giving credit you must depend largely upon your ability to read human nature and character at the first sitting. In sending statements, don't itemize unless demanded. Make collections promptly. Send collector or call personally ten or fifteen days after mailing statement. Have no hesitation about this point. I advise that you keep a careful record of each operation. In this way you have evidence at hand as to whether you yourself inserted a certain filling which had fallen out or whether it was done by another.

A word in regard to the social position which you may take. Be careful to mingle only with the cleanest element of the community. Take your place regularly in whatever church you may decide upon, paying for your seat, thus identifying yourselves with local interests.

This I advise whether you be a prayerful man or not. If the community be a small one your merits will soon be canvassed. You will be met more than half way and before you are aware of it you will be riding on the wave of popular approval. Ours is a *personal* profession and as we make our individuality approachable and agreeable so will our success be.

You will ofter be asked to pass opinion upon the operations of your professional brother. This must be adroitly done. If it deserves serious criticism do it kindly and carefully. If you are coarse in treatment it may react upon you, and above all in such cases avoid knowing the name of the one who did the work. No man can long stand upon a reputation built upon the wanton distruction of another. There is a place for every earnest, conscientious man, a place not occupied by another, and it remains for you to grow up to it.

Arrange your affairs each year so that you may take at least two weeks vacation in your favorite way. If you prefer to recoupe your lost energies surrounded by only the endless charms of nature, secure an Indian and armed with rod and reel, take your place each morning in his canoe and begin the day's sport. If it be the seashore which has your preference, go there. Again, if the irresistable longing for old scenes comes over you, go back to the old farm and spend your holidays. No matter what your preferences may be, indulge them to the end that each year will give you at least two weeks of absolute change and rest.

Immediately upon entering practice associate yourself with the local societies, and let your attendance be regular and continuous. By this means you will become known to your own profession and as time goes on you will grow into a position to be desired.

As soon as you have determined upon your location, your polite duty will be to call upon the prominent dentists of the community, and to tell them that you are ambitious to be "inter primos" in all your professional relations.

Should you select for your location a community where there was but one dentist, assure him by word of mouth that you propose to conduct your practice only along the lines of *professionalism.* You should remember that small communities are always endowed with limited toleration and consideration for others. To illustrate, let us put it this way. In the small community referred to having but one dentist, that man always looks upon the people of the place as his *particular right of plunder*, and resents any intrusion from the outside. You should placate him, doing the best you can to make him know that you are not bent upon taking *all* the bread from his mouth. All you desire is a *division.* You do not want his open enmity. On the contrary, you want his *professional friendship.* It may often occur that you may need some exchange of professional courtisies. Your stock of teeth or gold may unexpectedly run short. You may have an obscure case upon which consultation is suggested. How can you enjoy interchange of professional courtisies such as these if your relations be strained? Therefore, I admonish you to cultivate the confidence and respect of your competitors.

You are our first born and I beg you do not disappoint us by conduct disapproved by the Hyppocratic oath. which you will subscribe to upon graduating. Let your professional and social conduct be such that you can return each commencement day and mingle with your class mates without blush or regret. In whatever field you begin life believe me you have my friendship for a companion when practice is dull.

ADDRESS TO SEVENTH SOCIETY.

BY PRESIDENT W. W. SMITH, PENN YAN, N. Y.

GENTLEMEN: In bestowing upon me the honors attending the position I now occupy, you have placed before me a temptation which it is difficult to resist, viz: to rehearse the progress this society has made in the twenty-six years of its existence; name the members to whose influence and untiring labors this progress is due; and express my appreciation of the benefits I have derived therefrom.

While doing this would be a personal gratification, it would at this time be profitless. However, I cannot refrain from giving just a word of personal experience, and for which, I am sure, you will pardon me. It is this, that the little success I have had in the practice of dentistry is due more to this association than any—and I might say all other agencies combined. The instruction received and the inspiration you gentlemen have been to me as I have met you from time to time have had a broadening influence, for which I wish to thank you and ask your pardon that I have done so little in return.

At the close of the meeting one year ago, I purposed substituting for my vacation a tour through our district, visiting its dentists. This I have failed to do except in part, consequently the deductions and recommendations I now offer will be from a narrow standpoint, but I submit them for your consideration.

In the admirable address of my immediate predecessor at our twenty-fifth anniversary, he stated that only fourteen per cent. of the dentists registered in our state are members of its dental associations and added that he was proud of the fact that our own—the 7th—took the lead numerically, having a membership of sixty-five out of one hundred and fifty registered, or forty-three per cent. Now, I feel constrained to emphasize the word *numerically*, as I think no one will claim that our scientific progress is equal to that of at least three of our sister districts.

We of course cannot expect to measure up to the standard of these societies whose membership is almost wholly made up of dentists from our largest cities, with their attending advantages; but I wish to ask ourselves the question, are we elevating the standard of dentistry in our district as we may? Are we making our meetings of so high an order that the young men, yes, and young women, coming into our ranks from colleges that have given instruction far superior to their predecessors, can join us with a feeling of congeniality? Are we in position to extend to them the hand of welcome to a society in which the most cultured and refined will feel at home, and one in which those less favored will find influences which will promote a true professional character and which a cultured and refined community can respect? We are justly proud of the advancement made in dental science and its important factor, the dental society, but are we not in a measure resting upon our laurels? Is it not a fact that the percentage of our members who are making self-denying efforts to still further raise the standard is alarmingly small? To this the business committee will readily assent.

Our opportunities for advancement to-day are far superior to those of the past. We have but to reach out and our hands will be filled with helps which place the means of knowledge and consequent advancement before us, thus increasing our responsibility.

That there are a considerable number of reputable dentists within the confines of our district who are not members of this society no one can deny. The code of ethics is no bar to their entrance. If these could be convinced that in return for the time, energy and money spent here, their store of knowledge and usefulness would be commensurately augmented, I think they would join us without urging. I contend there is here the ability, if brought out, to make our meetings so full of interest that none will feel they can afford to miss them. Now the question is, how can this latent energy be brought into activity?

Not many of our members, I think, comprehend the trials of the business committee, who are responsible for the program and arrangements for the meetings. The difficulties they encounter in providing material for the program is, to say the least, very discouraging. They too often find it necessary to resort to asking the already over-burdened few, whose interest in the Society and sympathy with the committee is so great they cannot refuse. Let us each ask ourselves these questions: What has the Society done for me, and what am I doing for it in return?

No one unless he has had experience can comprehend the benefit to *himself* in preparing a paper for our meetings; and the service he will thus render the Society is only its due. If the business committee consider you competent to do this, it is an honor to you. Please consider it well before giving a negative reply. The members of this committee need all the encouragement every other member can give them.

Now, a few suggestions to the committee: First—That you decide upon a subject—or possibly subjects—to be considered at our next annual meeting, according to the recommendations of our State Society's President at the last meeting of that body. That you do this as soon as practicable after your appointment, and issue circulars to all members, requesting study of these particular subjects, and the accumulating of all information thereon, which can later be crystalized into a paper or in its discussion; but, if you send circular letters soliciting papers, please to inscribe on envelopes—"If not called for Postmaster will please deliver to any dentist," for then they go direct to the waste basket; it saves opening. No; select your men and let them know that you selected them. Write a personal letter that will inspire them, and if they refuse do not necessarily conclude it is from lack of interest; there may be other reasons. After the essayists have been secured, be sure to have it understood that each paper is to be in the hands of at least two who shall be named to open the discussion, giving them ample time for its proper consideration. Also seek to secure for every meeting some prominent educator who will give us inspiration. Do not seek to attract by suppers or any sort of an entertainment other than that which will elevate us professionally. This will be attraction enough for those whom the Society really needs.

Now, in regard to business methods: I think no one will question the assertion that the success of any organization depends largely upon its business methods, and the promptness with which they are executed. To allow members to be indifferent to their financial obligations in regard to payment of dues, etc., is not for the best interests of the Society and is unfair to those who meet these obligations promptly. It is a commendable charity that prompts to acts of leniency toward unfortunate members, but it is not required, nor is it for the Society's interest, to submit to indifference.

The board of censors is the door through which new members must enter. That this important board should be so organized that an application shall, at either the annual or semi-annual meeting, be promptly acted upon, and so carefully considered that a recommendation to the Society shall be unquestionable evidence of the applicant's fitness for membership, is important.

A word in regard to our State Society: It stands in the front ranks, but strange to say, we have from year to year a list of eight delegates, for which we pay into its treasury annually the sum of twenty-four dollars, and it is a very rare occurrence when more than one or two of these are seen at Alban. Is it possible there cannot be found members who may be elected to this position who can be depended upon to serve the interests of our district in this capacity? We hope this year will be an exception in that all delegates and other members will be present at the coming meeting, as it promises to be one of unusual interest. Its program has been arranged in accordance with recommendations of the President (referred to above) and we trust the subject, ("Green-stain,") to be considered will be so exhaustively treated that all who listen to and participate in its discussion will be greatly benefitted and return with an enthusiasm and a resolve to do their utmost in their several capacities to serve the best interests of our district. And as a result our meeting one year hence will be the best in its history.

A word in regard to this meeting, and I am done. The business committee have submitted an interesting program; whether or not we have an interesting meeting depends upon ourselves. We are honored by having the name of so distinguished an educator as Professor Barrett on our program. That what he may present will be listened to with much interest goes without saying. We have two important special committees to report. One appointed to consider the matter of a permanent place of meeting; and the other, for revision of the constitution. I would not presume to anticipate their reports, nor offer any suggestions, but they are important matters that should receive your careful consideration.

You have received circulars soliciting subscriptions for the "Horace Well's Permanent Memorial fund." I trust you have favorably considered this individually, also as a Society, that we may appropriate a sum which will be creditable.

I recommend that the business committee provide for the election of officers either at the close of the afternoon or evening session to-day, that the President elect may have time to properly consider the appointment of committees for the ensuing year. I think this would be no violation of our by-laws.

Within the year Dr. B. R. McGregor, one of the charter members of this society and a most competent member of the profession, has died. I recommend that appropriate action be taken at this meeting.*

THAT "RETICULUM."

Heitzmann discovered the reticulum. He gives you drawings of it in the different tissues. This is the prime evidence. Others have seen and made drawings of the reticulum and speak and write of it. This is certainly good corroborative evidence. Then both here and in Europe are those who have seen and made drawings of the reticulum independently of Heitzmann. This is also corroborative: sections which show the reticulum have been photographed. A section must necessarily be examined at high powers of the microscope in order to see the reticulum. But no photograph yet produced of a section at such high power can show what the eye can see. Even the thinnest section has a thickness which is very great when magnified by a high power, and the filaments of the reticulum do not lie on the surface nor all in one plane, but are in planes at innumerable angles with the line of sight. The reticulum is not an open network, but is embedded in a material not altogether transparent; so, for instance, take a filament at an angle of 45 degrees, and at high powers only a very small portion is in focus, and would only show as a dot or very short line, unconnected with anything else, whereas the eye could follow that line by focussing, and the observer, if expert, could of course follow out such lines and draw what he sees, and in that way show the reticulum as it is seen.

We hope at an early day to succeed in making a photograph just as the drawing is made by composite action of a number of negatives at different focal distances. Then we will have some astonishing revelations, such as we have synthetically in Marey's or the kinetoscopic photographs of objects in motion. Certainly with the wonderful improvements in high power microscopy and in rapid photography the correct combination will come soon. Meantime, Heitzmann's master drawings are not only better, but better evidence than present photographs.

Heitzmann's answer to doubt is the only correct one,—come and see. Come to his laboratory and learn how to see. Any one who is unable to see the reticulum does not know how to see it. He that will not accept Heitzmann's drawings will not accept even the coming photographs, and probably he that will not accept these evidences is not willing to go to the expense of time and trouble to learn how to see for himself; certainly that individual expense should not be all saddled on Heitzmann or Bödecker, *et al.*—Roy (F. A.), *International Dental Journal.*

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* Drs. Line, French and Requa were named as a committee to prepare a suitable memorial.

NEW YORK'S NEW DENTAL LAW.

AN ACT to amend article nine of chapter six hundred and sixty-one of the laws of eighteen hundred and ninety-three, entitled "An act in relation to the public health, constituting chapter twenty-five of the general laws," by revising said article and vesting the power of granting licenses to practice dentistry in a State board of dental examiners and assimilating in that regard the licensing of dentists to the licensing of physicians, and also to provide punishments for violation of the provisions of this act.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Article nine of chapter six hundred and sixty-one of the laws of eighteen hundred and ninety-three, entitled "An act in relation to the public health, constituting chapter twenty-five of the general laws," is hereby amended so as to read as follows:

ARTICLE IX.—PRACTICE OF DENTISTRY.

Section 160. Licentiates.
161. State board of dental examiners.
162. Examinations, licenses, registration, fees, revocation of licenses.
163. Construction of this article.
164. Penalties.

Definitions, as used in this article.—The terms university, regents and physicians have respectively the meanings defined in article eight of this chapter. Board, where not otherwise limited, means the board of dental examiners of the State of New York. Registered medical or dental school means a medical or dental school, college or department of a university, registered by the regents as maintaining a proper educational standard and legally incorporated. Examiner, where not otherwise qualified, means a member of the board.

§ 160. Licentiates.—Only the following persons shall be deemed licensed to practice dentistry:

1. Those duly licensed and registered as dentists in this State

prior to the first day of August, eighteen hundred and ninety-five, pursuant to the laws in force at the time of their license and registration.

2. Those duly licensed and registered after the first day of August, eighteen hundred and ninety-five pursuant to the provisions of this chapter.

§ 161. State board of dental examiners.—On the first day of August, eighteen hundred and ninety-five, the State board of censors of the Dental Society of the State of New York, as the latter body shall be composed at the date of such appointment, shall become the board of State dental examiners. The existing division of said censors into four classes and their terms of office shall remain the same for the said board, except that said terms shall expire on the thirty-first day of July in each year. Before the day when the official term of the members of any of said classes shall expire, the regents shall appoint their successors, to serve for the term of four years from said day. Such appointments shall be made from nominations made by such society from a list of nominees not larger than the number of the outgoing class furnished prior to the third Tuesday in May of each year by the State Dental Society, and no one shall be nominated or appointed who is connected with the faculty of any dental school or college, but this shall not be construed as applying to the present State board of dental examiners until the terms of offices for which they were last elected shall have expired. In default of such nominations, the regents shall appoint such examiners from the legally qualified dentists in the State belonging to the said State Dental Society. The regents shall also fill vacancies in the board that may occur by death, resignation or otherwise than by expiration of a term of office. All nominations and appointments shall be so made that every vacancy in the board shall be filled by a resident of the same judicial district in which the last incumbent of the office resided. The board shall convene at the call of the secretary of the regents within not less than two weeks after appointment and organize by electing, to serve for one year, a president and secretary. These officers shall be elected annually. No person shall be appointed an examiner unless he has received a dental degree from a body lawfully entitled to confer the same, and in good standing at the time of its conferment, and has been engaged within the State during not less than five years prior to his appointment in the actual and lawful practice of dentistry. Cause being shown before them, the regents may remove an examiner from office upon proven charges of inefficiency, incompetency, immorality or professional misconduct.

§ 162. Examinations —The board, in connection with the regents, shall frame rules from time to time for the regulation of their own proceedings and for the examination of candidates for license to practice dentistry. But no person shall be examined by said board unless he be at least twenty-one years old, of good moral character, and shall receive a certificate from said regents that he has satisfied them by examination or otherwise, that prior to commencing his professional studies he had a preliminary education equivalent to that required of students entering dental colleges of this State, which, after January first, eighteen hundred and ninety-seven, shall be not less than a full high school course; and either has been graduated in course from a registered dental school, or else, having the degree of doctor of medicine, has pursued thereafter a course of special study of dentistry for at least one year in a registered dental school, or holds a diploma or license conferring full right to practice dentistry in some foreign country and granted by some registered authority. Any member of the board may inquire of any applicant for examination concerning his qualifications and may take testimony of anyone in regard thereto, under oath, which he is hereby empowered to administer.

Degrees —A person having lawfully received a dental degree in course from a registered dental school, or the degree of Doctor of Medicine from a registered medical school, and having thereafter lawfully practiced dentistry for the term of five years, may apply to the regents for the degree of Master of Dental Surgery, which degree the regents may confer after examination of the applicant by the board under such rules and regulations as the regents and the board shall frame. No degree in dentistry shall be conferred in this State on any candidate who has not before matriculation in the institution conferring it, filed the certificate of the regents that he has had a satisfactory preliminary education, which for those matriculating after January first, eighteen hundred and ninety-seven, shall be not less than a full high school course.

Licenses.—On certification by the board of dental examiners that a candidate has successfully passed the examination and is competent to practice dentistry, the regents shall issue to him their license so to practice pursuant to the rules established by them. Upon the recommendation of the board, the regents may also, without the examination hereinbefore provided for, issue their license to any applicant therefor who shall furnish proof satisfactory to them that he has been duly licensed to practice dentistry in any state or country after full compliance with the requirements of its dental laws, and has been thereafter lawfully and reputably engaged in such practice for five years next preceding his application ; provided, that his preliminary and professional education shall have been not less than that required in this State. The regents may also license any applicant on the certificate of the board that after due investigation or examination it finds his education and professional attainments and experience of not less than five years in actual practice to be together fully equal to the requirements for license in this State. Every license so issued shall state upon its face the grounds upon which it is granted and the applicant may be required to furnish his proofs upon affidavit.

Registration.—Every person practicing dentistry in this State and not lawfully registered before this act takes effect, shall register in the office of the clerk of the county where his place of business is located in a book kept by the clerk for such purpose, his name, age, office and postoffice address, date and number of his license to practice dentistry and the date of such registration, which registration he shall be entitled to make only upon showing to the county clerk his license or a duly authenticated copy thereof, and making an affidavit stating his name, age, birthplace, the number of his license and the date of its issue, that he is the identical person named in the license, that before receiving the same he complied with all the preliminary requirements of this statute and the rules of the regents and board as to the terms and amount of study and examinations ; that no money, other than the fees prescribed by this statute and rules, was paid directly or indirectly for such license, and that no fraud, misrepresentation or mistake in a material regard was employed or occurred in order that such license should be conferred. The county clerk shall preserve such affidavit in a bound volume and shall issue to every licentiate duly registering and making such affidavit a certificate of registration in his county, which shall include a transcript of the registration. Such transcript and the license may be offered as presumptive evidence in all courts of the facts started therein. The county clerk's fee for taking such registration and affidavit and issuing such certificate shall be one dollar. Any licentiate practicing dentistry in any county of the State other than that in which he first registered shall in like manner register in the latter county also, and may do so upon presenting to the clerk thereof his certificate of registration from the clerk of a former county and the payment of a fee of twenty-five cents.

Examination fees.—Every applicant for license to practice dentistry shall pay a fee of not more than twenty-five dollars. From the fees provided by this article the regents may pay all proper expenses incurred by them under its provisions, and any surplus at the end of any academic year shall be paid to the society nominating the examiners to defray its expenses incurred under the law.

Revocation of licenses.—If any practitioner of dentistry be charged before the regents with unprofessional or immoral conduct, or with gross ignorance or inefficiency in his profession they shall notify him to appear at an appointed time and place, with counsel if he so desire, before the board to answer said charges, furnishing to him a copy thereof. Upon the report of the board that the accused has been guilty of unprofessional or immoral conduct or that he is grossly ignorant or inefficient in his profession, the regents may suspend the person so charged from the practice of dentistry for a limited season or may revoke his license. Upon the revocation of any license the fact shall be noted upon the records of the regents and the license shall be marked as cancelled of the date of its revocation. Upon presentation of a certificate of such cancellation to the clerk of any county wherein the licentiate may be registered, said clerk shall note the date of the cancellation on the register of dentists and cancel the registraton. Any person whose license shall be suspended or cancelled shall be deemed, while such punishment is in force, an unlicensed person and as such subject to the penalties prescribed for other unlicensed persons who practice dentistry.

§ 163. Construction of this article.—This article shall not be construed to prohibit an unlicensed person from performing merely mechanical work upon inert matter in a dental office or laboratory, or the student of a licentiate from assisting his preceptor in dental operations while in the presence and under the personal supervision of the instructor, or a duly licensed physician from treating diseases of the mouth or performing operations in oral surgery. But nothing in the provisions of this article shall be construed to permit the performance of dental operations by any unlicensed person under cover of the name of a registered practitioner. Any student of dentistry whose certificate of study under private preceptorship shall have been duly filed with the secretary of the State Dental Society at the time this act takes effect pursuant to the provisions of law then in force, may present himself for examination to the board under the same conditions as those under which he might have presented himself for examination before the censors of the State Dental Society under the laws in force when his certificate was filed; providing, however, that he shall file a notice with the regents on or before the first day of September, eighteen hundred and ninety-five, that he proposes availing himself of this exemption.

§ 164. Penalties.—(*a*) A person who, in any county of the State, practices or holds himself out to the public as practicing dentistry, not being at the time of said practice or holding out a dentist licensed to practice as such in this State and registered in the office of the clerk of such county pursuant to the general laws regulating the practice of dentistry, is guilty of a misdemeanor, and punishable upon conviction of a first offense by a fine of not less than fifty dollars, and upon conviction of a subsequent offense by a fine of not less than one hundred dollars, or by imprisonment for not less than two months, or by both such fine and imprisonment. Any violation of this section by a person theretofore convicted under the then existing laws of this State of practicing dentistry without license or registration shall be included in the term a subsequent offense.

(*b*) A person shall be deemed guilty of a misdemeanor. and upon every conviction thereof shall be punished by a fine of not less than five hundred dollars or by imprisonment for less than six months, or by both fine and imprisonment for not less than five hundred dollars or by imprisonment for not less than six months, or by both fine and imprisonment, who

(1) Shall sell or barter or offer to sell or sell any diploma or document conferring or purporting to confer any dental degree or any certificate or transcript made or purporting to be made pursuant to the laws regulating the license and registration of dentists ; or,

(2) Shall purchase or procure by barter any such diploma, certificate or transcript with intent that the same shall be used as evidence of the holder's qualification to practice dentistry, or in fraud of the laws regulating such practice ; or,

(3) Shall, with fraudulent intent, alter in a material regard any such diploma, certificate or transcript ; or,

(4) Shall use or attempt to use any such diploma, certificate or transcript which has been purchased, fraudulently issued, counterfeited or materially altered either as a license or color of license to practice dentistry or in order to procure registration as a dentist ; or,

(5) Shall practice dentistry under a false or assumed name ; or,

(6) Shall assume the degree of bachelor of dental surgery, doctor of dental surgery or master of dental surgery, or shall append the letters B. D. S., D. D. S., M. D. S. to his name, not having had duly conferred upon him by diploma from some college, school or board of examiners legally empowered to confer the same, the right to assume said titles ; or shall assume any title or append any letters to

his name with the intent to represent falsely that he has received a medical or dental degree or license.

(*c*) Any person who in any affidavit or examination required of an applicant for examination, license or registration under the laws regulating the practice of dentistry shall make willfully a false statement in a material regard shall be guilty of purjury, and punishable upon conviction thereof by imprisonment not exceeding ten years.

(*d*) All fines, penalties or forfeitures imposed or collected for violations of the foregoing provisions relating to dental practice and the corresponding sections of the penal code must be paid to the State Dental Society. Said society may prefer a complaint for violation of the law regulating the practice of dentistry before any court, tribunal or magistrate having jurisdiction, and may, by its officers, counsel and agents aid in presenting the law and facts before such court, tribunal or magistrate in any proceedings taken.

§ 2. Laws repealed.—Of the laws enumerated in the schedule hereto annexed, that portion specified in the last column is repealed, but it is expressly provided that any license or registration duly obtained in this State prior to the first day of August, eighteen hundred and ninety-five, without fraud and in full compliance with provisions of the laws in force at the time of its procurement shall not be affected by the repeal of those laws, but shall continue to be as valid as it was at the time of its procurement

§ 3. This act shall take effect upon and after the first day of August, eighteen hundred and ninety-five.

SCHEDULE OF LAWS REPEALED.

Laws of—	Chapter.	Sections.
1868	152	All of section seven after and including the words "whose duty it shall be," and all of sections eight, nine and ten.
1876	331	All.
1879	540	All.
1881	376	All.
1889	337	All.
1892	528	All

Some of those who have tried the Calihan method of root treatment preparatory to filling wonder what becomes of the cotton they shouldn't have used. Drop a tuft of it in sulphuric acid, keeping your eye on it the while.

LINING CAVITIES WITH CEMENT FOR GOLD FILLINGS.

Some twelve or fifteen years ago the practice of partially filling a cavity with cement, and at a subsequent sitting finishing with gold was suggested (I think) by Dr. D. D. Smith, of Philadelphia. This has been practiced to a greater or less extent since that time.

Later the plan of filling the cavity partly full of cement and after waiting for it to partially harden, proceed to finish with gold at the same sitting, has found advocates and followers. There are some objections to this plan to my mind; if the gold is introduced immediately there is no substantial foundation upon which to build, so one must wait for the cement to thoroughly harden if he would have a solid filling.

Both of the methods above mentioned have been thoroughly tested by me, because while I believe that gold is the best filling material for good teeth with good surroundings, we have a class of frail teeth with unfavorable surroundings which we must preserve, and gold unaided does not give us the results that we desire.

I know that in giving theories I am treading on dangerous ground, for many of the theories and some of the facts that we regard as established must soon withstand severe inspection and criticism or go to the wall, but as it is difficult to prove these theories it will also be difficult to prove that they are fallacious.

In a tooth of poor structure we sometimes find a beautiful gold filling with apparently perfect margins, but the color of the tooth shows extensive decay around the filling; this in spite of the fact that the operation may be from your own hand, or from that of some good dentist. With a cement filling the same condition would not be expected, but the dissolving or wearing away of the cement might be found. Cement will many times arrest decay in teeth that seem to melt away from gold like chalk.

I can think of no reason why there should be a recurrence of decay in a properly prepared cavity under gold as cited, any quicker than under cement, unless it be that the tubuli will allow sufficient moisture to gather under the metal filling to produce decay; but the tubules being perfectly sealed under the cement filling, the moisture is excluded.

If the margin of a cavity filled with a cement that adheres to the walls breaks away, the moisture does not follow the joint between the filling and dentine, but will penetrate only as far as the fracture extends. Sometimes this is a great advantage, as it prevents decay the deeper portions of the cavity until there is an opportunity for epair.

On the other hand, how many times do we find a small break in e margin of a cavity filled with gold, has allowed the moisture to ollow the joint by capillary attraction, and decay following, exposes e pulp in a very short time.

Thinking to receive the benefit of the moisture excluding property f the cement, I began using it in combination with gold by placing small quantity in the bottom of the cavity and immediately intro-ucing gold (preferably noncohesive or crystalloid). During the ondensation of the gold the cement is spread over the surface of e dentine, forming a thin layer adapting itself perfectly to the alls. Care should be taken to condense the gold as thoroughly as any filling. Of course, the margins should be left free from the ement so that the gold can be approximated to them. A slow set-ing cement is preferred, and one that will adhere closely to the alls and the gold, while it should be mixed so as to have a good ody, it should not be thick enough to lose its adhesive quality be-ore the gold can be introduced and driven firmly into place.

I had been using this combination some time when an article ap-eared which advocated the use of cement with amalgam in a similar anner; the writer of which likened the cement to glue that is laced between two pieces of wood. I think this is a very good imile, the cement being driven into the smallest inequalities of the entine and gold, as the glue is driven into the pores of the wood.—OYCE (E. A), *Dental Review.*

PHYSIOLOGICAL ROLE OF THE THYROID GLAND.

This subject has been summed up by Notkine as follows: Total hyroidectomy causes death of the animal, whatever its habits or the ature of its food. The death of an animal after thyroidectomy is ue to the accumulation of one or more poisons in the system. This ondition of toxæmia is termed cachexia strumipriva. The true uto-intoxication is much more marked when the animal is not fed.

The thyroid gland secretes a substance capable of decomposing r neutralizing toxic substances developed by the tissue changes in he body. Exactly the nature of these poisons and of the antitoxine roduced by the thyroid gland, has not yet been determined.

The author has succeeded in extracting from the thyroid gland a oisonous substance, which produces all the symptoms of cachexia trumipriva. This substance, when injected into the body of an animal, first appears to be stimulating, then paralyzing. Emaciation occurs if the doses are too small to be immediately fatal.

The author suggests that the colloid substance contained in cystic poisons is not a secretion from the thyroid gland, but is an accumulation of waste material within the body. It is the duty of the thyroid gland to rid the blood of the poisonous substances in it by storing them up in the cells of the gland, where they are neutralized and rendered harmless, then eliminated.—*Modern Medicine.*

RESULTS OF EXPERIMENTAL ROOT-CANAL FILLINGS.

To *write* about "Filling Root-Canals" is a comparatively easy thing to do, especially if in the nature of advice.

To *fill* root canals is decidedly *not* an easy task.

To fill a miscellaneous lot of canals, afterward testing for perfectness or otherwise, is a humiliating procedure, owing to the fact that the "otherwise" than perfect is the rule of discovery.

If any one or more of you think that when you have filled the canal or canals of a tooth in a given case, that seemed to belong to a class that you had deemed "fair to middling," so far as being readily filled is concerned, I beseech you to fill twenty or thirty canals of extracted teeth, after which open and examine for results.

I have been laboring under the comfortable delusion that I was a *fair* root-canal filler. The delusive wheel has slipped its spindle and has rolled to your feet, and I stand humbled and chagrined before you at the results of my efforts in filling the canals of a few teeth, which I have opened and now place before you for inspection.

I have chosen six of the more common methods of procedure found in practice, and with each method used I have filled the canals of five teeth which you will find stuck to blocks of wood with sealing wax. The five blocks holding similar canal fillings are tacked together on a leather strap. These teeth are all of recent extraction with living pulps at the time of removal from the process, the pulps being removed about two weeks after extraction.

The different methods are designated by numbers as, 1, 2, 3, 4, 5, and 6, and the teeth by letters as A, B, C, D and E. These numericals and letters are seen on the sides of the block.

The first method represents the canals moistened with eucalyptus oil; then chloro-percha, moderately thin, pumped in the canal with a broach till full; then forcing a gutta-percha point in, displacing much or most of the chloro-percha, the points of solid gutta-percha varying in thickness according to size of canal.

The second method used was that of filling the canals with thin oxy-chlo-zn cement, forcing it in with considerable pressure. In two instances the cement was tinted with red analine.

The third method represents the canals filled with wax (maroon colored beeswax), pumped or coaxed into the canal by a heated broach, after which a hot copper wire was forced through the wax as far into the canal as was possible, fitted previous to the insertion of the wax by tapering and flattening according to shape of canal.

The fourth method consists of filling the canals with chloro-percha, without moistening the walls with any drug, merely pumping in with a broach till full, then filling pulp chamber with warmed gutta-percha, and pressing into place with slight force.

The fifth method shows the canals filled with thin oxyphosphate zinc cement, pumped into the canals the usual way.

The sixth method is after the plan that is a favorite with me in daily practice. Copper wires are fitted to the canals, extending them as near to the apical foramen as possible; then these wires are laid aside for a moment, and the canal walls are moistened with as nearly pure oil of eucalyptus obtainable. Then thin chloro-percha is pumped in till the canal is full; afterward a solid cone of gutta-percha is plunged into the canal, displacing a portion of the liquid gutta-percha, just as in method first. Now the copper wire is heated and forced into place through the gutta-percha.

The results of the fifth and sixth methods I cannot exhibit. Between my assistant and the janitor in "cleaning house" the other day the trays containing the teeth experimented with after these methods were lost, and time did not permit of going over the ground again.

You have enough before you, gentlemen, to laugh at, and laugh you may without fear of offense, for your efforts in that direction can but only add a fraction to what I have already gone through on my own account. The work done looks like that of school boys, but it is not; many of the canals that I had supposed were being perfectly filled show defects, and those that there was a question regarding their perfectness show well filled canals.—Cattell (D. M.), *Dental Review.*

Boxes, cans, etc., are always in demand in the laboratory for holding sand, marble dust, pumice, chalk, etc. Fruit and vegetable tins may be utilized by first washing, then holding in the flame of a Bunsen burner till the solder at the cut end melts, when the part will separate and leave an edge that requires no trimming.

EXPERIMENTS FOR DETERMINING THE INFLUENCE OF MOIST AND DRY FOODS, CONDIMENTS, AND NATURAL FOOD-FLAVORS UPON SALIVARY SECRETION.

In the following experiments the quantity of food or fluid was, in each case, one ounce. The food, whether solid or fluid, was taken into the mouth in small portions and chewed for a few seconds, then, being rejected from the mouth, it was received into a small vessel for weighing. The length of the experiment with each substance lasted exactly five minutes. The difference in weight between the substance after chewing and before, represented the amount of saliva which had been added to it during mastication. I might add that the granose used is a dry and well-cooked preparation of wheat in thin flakes.

One ounce of granose increased in weight 59.79 grams.

One ounce of granose with two grams of common salt increased in weight 58 80 grams.

One ounce of granose sprinkled with pepper increased in weight 59.1 grams.

One ounce of granose with 5 c. c. of strong cider vinegar increased in weight 55 9 grams.

One ounce of moist bread increased in weight 31 1 grams.

One ounce of raw apple increased in weight 38.1 grams.

One ounce of water increased in weight 2.92 grams.

One ounce of milk increased in weight 3.82 grams.

One ounce of pea soup increased in weight 5.82 grams.

The facts developed by the above-mentioned experiments furnish the foundation for most important therapeutic rules for the management of digestive disorders. It will be noted, on the one hand, that one ounce of dry granose chewed for five minutes so stimulated the active salivary glands as to enable them to produce almost exactly two ounces of saliva, or three times the normal amount normally secreted by the young man who was made the subject of the experiment; on the other hand, the amount of saliva secreted when water was passed through the mouth amounted to a little less than 3 c. c. in five minutes, or less than one seventh the normal amount. With dry granose the amount of saliva secreted was more than twenty times as great as with water.

With moist bread the amount of saliva secreted was almost exactly half that with dry granose.

With milk the amount of saliva produced was only about one-third more than that produced with water.

With pea soup the quantity was just twice as great as with water, but the amount was still only one tenth the amount produced with dry granose.

This fact places before us in the most graphic and emphatic manner the necessity for the use of dry food in cases of salivary indigestion. Instead of feeding our patients with malt, pancreatin, diastase and predigested foods, we have only to make our patients chew dry food, and in so doing they will develop in abundant quantity a starch-digesting ferment of greater value because better adapted to the human stomach, than any possible artificial digestive agent which could be administered.

The use of "slops" is one of the most dietetic errors among the American people. The American eats in a hurry, rinses down his food with copious draughts of tea, coffee, iced-water, iced-milk, or iced-tea, and in consequence the salivary glands are not stimulated to proper activity so that the amount of saliva produced is altogether inadequate to digest the starchy elements of food in the acid medium of the stomach contents, and the small amount produced is so diluted that its efficiency is greatly impaired. What wonder that starch indigestion is coming to be an almost universal complaint, as shown by acidity, eructations of gas, flatulence, and a great variety of stomach disturbances, to escape from which multitudes are continually swallowing vast quantities of magnesia, soda, neutralizing cordials, and alkaline mineral waters of various sorts, together with malt extracts in grert variety?

The inability to digest starch is doubtless one of the great causes of the inordinate consumption of beef and other animal products, to which the average American has come to be addicted, not altogether in imitation of his English cousin, but as a method of escaping the pangs of starch indigestion.

The abundant provision made in the human body for the digestion of starch, first, the saliva, second, the bile and pancreatic juice, third, the intestinal juice, and finally, the liver, is evidence that nature intended man to subsist largely upon farinaceous foods. The arguments of the "natural food" advocates who insist that man should live upon fruits and nuts, are based, not upon physiological facts, but upon the pathological experience of the disciples of this doctrine. The writer had an opportunity, a year or two ago, to examine the stomach fluid of one of the most earnest and stalwart advocates of the fruit and nut diet, and found, as he expected, that the patient was a most pronounced case of this sort. The stomach was greatly dilated, and was almost completely inert.

We have cured many scores of very chronic and obstinate cases of dyspepsia by simply requiring the patient to subsist upon a dry diet, whereby he was compelled to thoroughly masticate his food. A favorable prescription with the writer, which is applicable to most cases of indigestion, is a couple of ounces of dry granose at the beginning of each meal. This introduces into the stomach an abundant quantity of saliva,—probably from four to six ounces in most cases,—and ensures efficient starch digestion in cases of both hypopepsia and hyperpepsia. It also serves to mitigate the acidity of hyperpepsia, and operates to prevent fermentation by the rapid solution and conversion of the farinaceous elements, thereby promoting their absorption. I am inclined also to the opinion that the maltose produced by the salivary secretion exercises in some way a controlling and beneficial influence in the process of stomach digestion. The presence of maltose in proper quantity may be the means of aiding glandular activity.

This is a subject which I am endeavoring to investigate, and upon which I hope to be able to throw some light by further experiments.

At a recent meeting of the American Medical Association, in a discussion which occurred upon a paper read by the writer, in which vinegar had been condemned on account of its powerful inhibitory influence upon salivary digestion, one of the speakers suggested that the stimulating effect of vinegar upon the salivary glands, thereby promoting the secretion of saliva, might more than counterbalance the inhibitory influence of this condiment,—in other words, the extra amount of saliva produced by the vinegar might more than balance the lessened activity of the secretion resulting from the presence of this acid. The same thought was expressed in reference to salt, pepper, and other condiments. I consequently subjected this matter to experiment, with the results already stated in this article. The amount of saliva secreted, when salt, pepper, or vinegar was added to the granose, was in each case less than when the granose was taken by itself. In the case of vinegar the deficiency was much greater than with the other condiments.

We see from this that dryness is the property in food which stimulates the salivary glands to activity. A perfectly dry food excites the maximum amount of activity. The degree of stimulation produced by a dry food, such as granose, is indeed surprising, the amount of saliva secreted during the five minutes required for the mastication of the somewhat bulky granose (the young man masticated the food as rapidly as possible, ejecting it from the mouth as soon as it became well moistened) being twice the weight of the granose itself. The slightly lessened stimulating effect observed when pepper was added was probably accidental, as the figures agree as nearly as three experiments with granose alone would be likely to agree. However, the amount with vinegar is perceptibly less, showing that nature does not propose to waste energy in secreting saliva to be spoiled ; in other words, a substance which destroys the activity of the fluids produced, is not capable, apparently, of promoting the activity of the salivary glands in the secretion of saliva. I do not undertake to lay this down as a general principle, but it seems to hold good in relation to vinegar at least. I have planned an extension of this experiment as a side-line of this interesting inquiry.

Another experiment of interest in the same connection was made for the purpose of determining the relative value of natural flavors; that is, such flavors as are found in natural and wholesome foods in stimulating the secretion of saliva.

The mastication of an ounce of apple within five minutes produces 34 c. c. of saliva, 3 c. c. more than was produced in the mastication of moist bread. The proportion of water in the apple was certainly not less than that in the moist bread, nevertheless a larger amount of saliva was secreted, resulting doubtless from the stimulating effect of the natural flavors of the apple.

We have not space in this department to go further into the practical deductions which may be drawn from these experiments. The subject is a comparatively new one, as almost no experimental work has been directed toward it, probably in consequence of the generally received assumption that the activity of the saliva upon the food ceases as soon as it enters the stomach. More recently developed physiological facts in relation to salivary digestion, which are very clearly stated by Freirichs, Ewald, Gamgee, and other excellent authorities, must lead to a revolution, not only in relation to our way of looking at stomach digestion, but also in relation to the therapeutics and diatetics of a large class of digestive disorders.—*Modern Medicine.*

THE NATURE OF THE TRANSPARENT ZONE OF DENTAL CARIES.

Mr. Bennett said in substance, that among the phenomena of dental caries there were none of greater interest, none upon which opinions still differed more, than those relating to the zone of transparency. A true knowledge of the nature of this appearance was desirable, not only in relation to dental caries, but also as throwing light on the properties of dentine itself. For should the zone of transparency prove to be a manifestation of a physiological activity of the living parts of dentine, that structure would be brought into much closer affinity with the other tissues of the body than would be possible to ascribe to it otherwise. The evidence which he would place before them might be considered as the outcome of an enquiry on his part as to how far the zone of transparency favored the view of vital activity in response to the stimulus of caries, or the reverse. Dentine in this condition had formed the subject of so many able and well known enquiries on the part of others, that he could do no more than summarise the results. The opinions generally resolved themselves into the question : "Is the transparency due to increased calcification of the part or not?" There could be no doubt that this point, clearly proved, would go far to settle the matter. The most damaging argument against those who held the view of increased calcification of the fibril, was that which asserted that a transparent zone was to be found in natural teeth mounted on plates, and which had subsequently been attacked by caries. For it would be difficult to understand how a fibril could become calcified when once the tooth was dead. However, the presence of the transparent zone in relation to caries, in such teeth, appeared to be doubted by Dr. Miller. But although he speaks of having "split about sixty" which appeared specially suited for the purpose, one case only revealed a phenomenon resembling transparency, but even in this case it was not possible to say the change was not brought about whilst the tooth was still living. It should be remarked, however, that Dr. Miller did not mention having examined the specimens under the microscope. Dr. Miller, returning to the general question of the zone of transparency, said : "A decalcification, however, has most certainly not taken place in the transparency in question." The matter being left an open question, Mr. Bennett determined to examine specimens stained with gold chloride, and further, select, amongst others, teeth in which there was a partial or complete arrest of the caries, as in these the fibril might be supposed to be calcified from the fact of the arrest. With two obvious exceptions the teeth were all fresh, with living pulps. No acid whatever was used in any part of the process. They were ground, polished, soaked in the gold chloride solution, and finally mounted in glycerine jelly. The dentinal fibril and the carious portions are the deeply stained portions The specimens were then shown on the screen, and the appearances of each described.

A number of slides were then shown from which Mr. Bennett found support for the following conclusion, stated in his own words :

"Inasmuch as enlarged and thickened tubes can be demonstrated in parts—I do not say in every part, and in all cases—we cannot regard the zone of transparency as an area of increased calcification, and that the phenomena point to the zone as representing a precursory stage of dental caries."

Mr. Mummery regarded the paper as a very interesting contribution to the pathology of caries. He thought it possible that the occurrence of the enlarged tubes and tube walls might be accounted for by the encroachment of the zone of decalcification on the translucent zone, thus accounting for the appearance in the dentine. He considered that the zone shown by Mr. Bennett was distinctly the old transparent zone, but there was some encroachment upon it by the zone of partial decalcification.

Mr. Colyer asked whether in the incisor tooth, of which sections had been shown, the author was quite certain that caries had not started previously to it being fixed on the plate. He also inquired how the author accounted for the translucent appearance shown in the dentine long before the whole of the enamel was quite disintegrated, and said that a translucent zone was often seen in teeth which were not the subject of caries at all, but of abrasion or erosion.

Mr. Bennett wished to draw attention to one point which seemed to have escaped attention. The author had said in the early part of his paper that this was an investigation set on foot for the purpose of determining a certain thing, whether there was an increased calcification, or, on the other hand, softening in the zone of transparency. The evidence of the paper was to show distinctly that there was no vital action in the tooth, and no attempt at calcification in forming a zone to arrest the approach of caries, but, on the other hand, what had formerly been described as the transparent zone, which was supposed at one time to be a barrier set up against advancing caries, was pretty clearly shown by the specimens to be an enlargement, not contraction of the tubes as there would be if excessive calcification had taken place in them. He did not quite understand from Mr. Mummery whether he proposed to suggest that there were two zones of transparency, one the old zone described by the early writers, and the other undoubtedly due to acids described by Miller. The point he wished to enforce was that the paper specially aimed at examining the vital action in connection with caries. As this zone was very well marked indeed in teeth that had been worn on artificial plates, these facts seemed to him a most convincing argument against the vital theory.

Mr. Mummery said what he meant to convey was, that he understood the zone shown to be the ordinary translucent zone (as Mr. Bennett had said) of the old masters, and there had been an encroachment at some period upon it by the zone of decalcification, which accounted for the appearance in the dentine. There had been caries and arrested caries, and the decalcification zone had worked as it were into the zone of translucency, because in most of the specimens the disappearance of the dentine was near the line of micro-organisms, not very far down the zone of transluency.

Dr. Cunningham would have been glad to have examined microscopical sections before proceeding further with the discussion, as it was a little difficult to criticise and arrive at conclusions from demonstrations made upon the screen. He did not quite see with the eyes of the demonstrator, and thought that possibly the thickness of the tubes was somewhat due to their diagonal cut, so that they exhibited an appearance which he believed not pathological at all.

Mr. Sewill fully endorsed Mr. Bennett's conclusions on the theory of vital action. Seeing that tooth structure was composed of 76 per cent. or more of mineral matter, and contained no blood vessels, it seemed to him evident that no vital action could have taken place. It would have been interesting if the specimens had been stained for micro-organisms, it would then have been possible to see more exactly where the micro-organisms had penetrated, and probably have discovered, as Mr. Mummery pointed out, that they must have gone very near indeed to the zone of translucency. The pipe stem was sufficiently accounted for by the swelling and enlarging of the dental tubules. Several gentlemen had mentioned the fact of these appearances being seen in teeth worn on artificial plates; it must have resulted from dental caries produced artificially, and no doubt Mr. Bennett had put them entirely right on this point.

Mr. Bennett, in reply, said Mr. Mummery's point seemed to be that the translucent zone had subsequently been affected by the previously existing caries, in other words the old caries might have produced the translucent zone. As a matter of fact, the caries were all one. because although it might have been arrested at one point it was continued at another; it was not a second case of caries which had arisen. If the enlarged tubes were due to primary caries, why should not caries affect the secondary dentine? That appeared to be a strong argument, seeing that the secondary dentine was shown to be normal. They knew also that the first thing that attacked caries was stain, then why, if the enlarged tube was stained as shown in the slide, should not the stain have followed on to the translucent zone. He thought that wherever active caries was going on they would get a stain. However, it was far from his desire to be dogmatic, and in Mr. Mummery's criticism he recognized nothing but a desire to elucidate the truth. With regard to the specimens handed to him by Mr. Colyer, he failed to find any trace of decay having occurred previously to the mounting of the tooth. Again, if the teeth were taken off the pins and examined, the caries was found to be in a part in which it was impossible to have been present during life, that was to say underneath where the pin came through the tooth, because until the tooth was cut in half it could not have become exposed round the margin of the pulp cavity. With respect to Mr. Colyer's remark that there was a zone in attrition, and a zone in erosion, his paper was really a branch of a larger enquiry into the changed condition in attrition. He should be very pleased indeed if Mr. Colyer could furnish him with specimens in which he said there was a zone of translucency in attrition, and still more so if he would show a specimen in which erosion showed the smallest attempt at a translucent zone. They might get a secondary deposit of decalcification, but having made many sections of erosion in different positions he had never seen the faintest tendency to increase calcification or a zone of translucency in such a section. Mr. Cunningham had suggested that the specimens on the screen were a little deceptive, and that when they came to the microscope itself they might read a different story. All that he could say was that Mr. Cunningham was welcome to make a very close and critical examination of the specimens to see whether they did not accord with the microscopic sections.—*Dental Record.*

THE PENETRATION OF MICROBES INTO THE BLOOD.

M Nocard reported, at a recent meeting of the Society of Biology, Paris (*La Press Medicale*), experiments by which he has been able to demonstrate that microbes are capable of entering the blood through the alimentary canal. He found that, while the blood is usually sterile after an ordinary meal, a few microbes being found in the blood, after a meal containing a considerable quantity of fat, microbes were found very abundant. His theory is that microbes are taken up by the lacteals.—*Modern Medicine.*

ECONOMIZING TIME—COMPENSATION.

A busy dentist can also economize his own time still further by giving much of the detail work, which too many dentists do themselves, in charge of the assistant at the chair; for instance, keeping an account of the time given, diagraming the work performed at each operation, making a record of the same, also of the dictated remarks in regard to the work, the materials used, the roots filled, the capping of pulps and their condition when capped, the alveolar abcesses treated, how and when, the treatments of pyorrhea, what used and which part of denture taken care of at each particular sitting. In this way a record of everything that may be of advantage in the future may be kept, and will be found invaluable.

But all this is very fatiguing if the busy man of practice does it himself, and it will be more sure of accomplishment and much better done if we have a trained and careful secretary to whom we can entrust all this recording of service, etc. Such an assistant can soon be trained to do the work satisfactorily with such dictation as may be necessary to enable us to know at any time what has been done. This lady assistant should always record the time given to each sitting, and with the records thus taken all we need to do before rendering a bill is to decide what shall be the charge. This we believe can best be decided by a record of the time consumed, charging by the hour being the most accurate method. We will modify this by the further proposition that some operations, and the services rendered some patients, should command a higher fee than others, independent of the question of financial ability ; owing to the fact that difficult operations as well as very nervous and ungovernable patients exhaust our energies more than others ; and the compensation should be in accordance with these conditions, but the only sure and ready way to estimate the charge is by the hour.

The plan of charging by the filling is open to many objections—let us illustrate. If the bill is to be rendered as giving the number of fillings, the temptation is to have the number as large as possible, and this is often the reason why divisions between cavities that should have been removed are allowed to remain. The bill will look better showing ten gold fillings than if it shows five, which it would have if the weak divisions between two or more fillings in the same tooth had been removed; requiring perhaps a little more time, but giving a more permanent operation. But the bill of items showing ten gold fillings is more likely to meet with a favorable acceptance than one of the same case where the fillings have been reduced to five by doing away with the weak walls.

To a practitioner of any experience this one illustration will suffice for many which could be given to show that the method of charging by fillings is very objectionable. The writer could describe many such cases, but one comes to mind that occurred during our early practice. We were consulted in regard to certain work and when asked to give our price, we named $20 for one particular tooth, a lower first molar. The husband and wife left our office and called upon a neighboring dentist who gave them the information that he seldom charged more than $10, his prices ranging from $5 upwards. etc. The work was performed by this dentist and the bill rendered with the fillings diagramed and the charges itemized, but the tooth which should have been filled with one large gold filling, as we had planned, had five separate gold fillings. These same patients returned to consult with us a year afterwards and brought with them the itemized bill which had been paid upon presentation, and which was rendered for $25 for the five gold fillings in this same first molar. The divisions left had in the meantime broken away and the tooth required refilling.

A little reflection will show that an honest practitioner places himself at a disadvantage or in competition with dishonest methods if he charges according to the number of fillings. Besides, a professional man charges for his services, and many times they are given for other duties than filling: viz, for removing cavities, studying out a plan in the first sittings of how the work shall be performed, instructing in the care of teeth, etc.; all of which are fully as important services and of quite as much value to the patient, so the only way to get a correct estimate of the work is by knowing the actual time given to it.

With all the precautions heretofore spoken of in regard to informing the patient what the bill for services will be, there will frequently be misunderstandings and disputes; especially is this true with young practitioners who have not an established practice. It is often difficult to make those requiring our services understand that of necessity good service takes time, ability, an immense amount of energy, and a skilled experience, all of which in justice should be well paid for. Some of the arguments in favor of good compensation to a dentist are, that it takes a man of ability to make a good dentist, and quite as much ability as is needed in any profession; a dentist's education is expensive, and from eight to ten years are necessary to learn how to conduct a practice; the business is an unhealthy one and the lifetime of the business of a dentist, or the time in which he can make money, is much shorter on the average than that of any other profession or occupation; therefore, during this time his compensation should be greater; finally, his expenses are very high in proportion to his income.—CROUSE (J. N.), *Dental Digest.*

PRACTICAL POINTS.

Hint on Repairing Rubber Plates.—It is often a difficult matter to obtain a perfect cast of broken plates, especially is this·the case if the plate is a lower one, with a good deal of undercut. I get good models of such plates, by casting in sections, and removing one section at a time. The model can be made in two, three, or even more sections if desired ; bearing in mind that they must be cast in such a way, as to avoid the under-cut, and allow of easy removal. Suppose you have a lower plate, broken between the central incisors ; take two pieces of base plate wax, warm them, and place them in each section of the plate at the first bicuspid ; to form a dam for the plaster to flow against. Now, oil lightly, mix the plaster, and pour each section ; when the plaster is sufficiently hard, remove the wax ; bore holes, or cut grooves in the end of each plaster section (to serve as guides), varnish and oil them ; place the broken parts of the plate together in proper position, and pour the middle section of the cast. When set, remove the sections, place together in their relative positions ; lock in place with plaster, and proceed as usual with the repair.

To Mend a Broken Cable.—A quick and strong way to repair a broken engine cable, is to bend a piece of brass in the shape of a tube, of proper size to fit snugly over the broken ends of the cable. Thoroughly clean the broken ends of all grease and dirt ; slip them into the tube ; put on a little soldering acid ; lay a piece of jewelers' soft-solder along the joints of the tube ; hold the tube over a spirit lamp, until the solder melts and flows into it, and around the broken cable. Trim off all surplus solder, round off all sharp corners, and, if the work has been properly done, this will be the strongest part of the cable.

Convenient Finishing Strips.—The thin pieces of cloth that come packed between the sheets of pink rubber, make elegant finishing strips ; the sheet can be torn into strips of the desired width as needed, and used for smoothing off amalgam fillings, cleaning between teeth, etc. Being thin and strong, it also makes a nice vehicle for carrying polishing powders, when finishing gold or other fillings brush a little glycerine on the strip. and sprinkle with emery, buckhorn-crocus or cuttle-fish powder.

A Cover for the Work-Table.—The composition rubber strips used by stamp makers, for covering the wood face of the mount before putting on the die, make the very best kind of pads for the laboratory finishing table. It looks neat, makes the work of filling and scraping almost noiseless, finished work will not get marred or scratched by coming in contact with it, the piece of work is not slipping around on the bench, but is easily held in place; gold trimmings and filings are readily seen on it, and easily removed. This material comes in rolls of different widths, sells at 60 cents a pound, and can be got at any of the rubber dealers.

RETAINING MEDICINES IN CAVITIES.—This is an easy operation in any of the simple cavities, but when applying the arsenical preparations in large approximate cavities, it is often quite difficult to seal it in properly. If the space between the cavity and the adjoining tooth is not too great, a piece of softened gutta-percha can be formed, and fitted into the space, so as to close the entire cavity except a small opening in the crown through which the application can be made and sealed in. If the tooth is too isolated to treat in this manner, a shell crown can be formed of thin sheet gutta percha; slipped over the tooth, and a hole made through it, for introducing the application.

ABOUT ENGINE BURS.—Many members of our profession are in the habit of buying their supplies and instruments in too small quantities; which is a very uneconomical way of conducting business. Take for instance, the item of engine bars; they are usually bought of the nearest dental depot, in small lots of one or two dozen at a time, at a cost of about $2.25 per dozen; while if ordered in gross lots, a first-class bur can be had at a big reduction per gross. When ordering from the manufacturer, be particular in specifying exactly what is wanted, keep a copy of the order; when the goods come, if not according to order, or up to standard in quality, return the defective ones and you will probably have no further trouble in getting what you order. After receiving a nice stock of burs, the next thing is to take proper care of them; they should be kept clean, free from rust, and out of the sunlight. They should be put away in cases so arranged that selections can be made without having to handle over the whole stock.

When operating, a bur should never be laid aside until it is cleaned; this will prevent the lips from rusting, which will soon destroy the bur. At the trifling cost of each, there is no excuse for torturing a patient by using dull burs; and, that obtundent has never been discovered that can make excavating painless with a slowly revolved, poorly made, dull bur, under pressure, in a flooded cavity. While, on the other hand, the majority of teeth can be excavated with little or no pain, by using good sharp burs, run at a high speed, handled with a light intermittent touch, the cavity being kept absolutely dry.

Cracked Plates.—We often have trouble with upper plates cracking, or breaking entirely in two, along the median line. When this accident occurs, the plate is *sent* to the dentist who usually repairs the break, and returns the plate, without seeing the patient ; only to have it sent back in a few months (or go to some other dentist), broken again in the same place. Some practitioners try to remedy the difficulty by making the plate thicker, or by putting in a metal stiffener, which only bridges over the trouble a little longer, as none of these methods reach the cause. To more fully give my idea of this trouble, and the proper remedy, I will cite a case in practice. Mr. M—, came into our office early one morning last fall, and remoming the cover from a little paste board box that he carried, he took therefrom the broken sections of one of these old chronics ; and placed them carefully in my hand, remarking, " I have had the plate mended twice a year for the past five years, and I have got so accustomed to it that I expect to pay the semi-annual dental assessment, with as much regularity as I do my taxes " I inquired if the plate was a good fit, and he replied, " Oh yes, it is a nice fit, and very comfortable ; I want you to be real careful and not alter the shape in repairing." Noticing that he had a bump of firmness on the top of his head, about the size of a goose egg, I knew that there would be little use to argue the case with him.

I took an impression of his mouth, made a cast, put the old plate on, and showed it to him ; he had no further objections to offer, against our making a new plate. The old one did not touch the alveolar ridge on the plaster cast anywhere ; and in some places, cleared it nearly the sixteenth of an inch. This is very often the cause of these breaks, and it is a useless waste of time, material, and reputation, to repair them. When a break of this kind is sent to our office for repair, I am always reminded of the street urchin's reply to the poet Pope.

Alexander Pope, who was a deformed cripple, had a habit, when irritated, of saying, "God mend me." One day, when passing along the street, a boy begged some money. Pope answered angrily, with his favored exclamation. The boy, cocking his head on one side, eyed his shrunken body, and exclaimed, " It would be a good deal easier to make a new man."—Steele (W. H.), *Ohio Dental Journal.*

In her haste this patient omitted the comma : " Please give me an appointment soon as my tooth troubles me."

ANÆSTHESIA AND ASPHYXIA.

Anæsthesia is a condition produced by the inhalation of various drugs, similar to the effects produced by different narcotics through alimentation, the forces of life being maintained in the meantime; in other words, a patient under the influence of an anæsthetic physiologically, is in the same condition as one under the influence, to the same degree, as alcohol, or the different preparations of opium. The process in effect is the same in each. We have first stimulation, intoxication, stupor or sensory paralysis, and unconsciousness, with death as a final result, if pushed too far. These effects, to the point of unconsciousness, through inhalation and exhalation, are produced and eliminated much more rapidly than of those by alimentation, and come about by first affecting the brain and periphery of the nerves simultaneously, through the stages of stimulation and intoxication and unconsciousness without touching the medulla, so that the force of life is unimpaired. This is anæsthesia.

Asphyxia will produce unconsciousness and death, but not stimulation or intoxication. It simply produces its effects by depressing the vital force, through depriving the blood corpuscules of their life-giving principle. Nitrous oxide possesses as true anæsthetic properties as ether or chloroform; but it also carries with it this deprivation of the life-giving principle, but not to the degree of producing unconsciousness by itself, or death, except in very rare instances. The anæsthesia is produced purely by the nitrous oxide, and the period of deprivation is so short that the effect is infinitesimal. If you give oxygen in combination with it, or, as I prefer and practise, admit a portion of atmospheric air during the inhalation, the affect of asphyxia will be almost imperceptible.—THOMAS, (J. D.), *Dominion Dental Journal.*

EXPERIMENTS *vs.* EXPERIENCE.

We learn by experience: and experience is begotten of experiment. But there is often a marked contrast, amounting sometimes to antagonism, between the lesson learnt from experiments made with a definite object and that experience which is gained by observation of daily work. Perhaps instead of antagonism we might more correctly have said apparent want of agreement, for, after all, the results must be in unison if the experiments be accurate and the deductions sound. There are, unfortunately, many points on which we come to grief when attempting to apply the result of an experiment to a practical purpose. Difficult as it may be to read our experiments correctly, or to free our minds from bias of a preconceived notion, it is infinitely more so to prove that the conditions of the experiment and of the application of its result are one and the same. Thus, iodoform has been shown experimentally to be valueless as a germicide, yet its use has the almost unanimous support of practical surgeons. The conditions of the experiment and those under which iodoform is used are not the same. In the one case the germ culture is on an inert material, in the other, the germs are growing, or may grow, in or near a living tissue. Thus, though iodoform may not be a direct germicide, yet it may indirectly be so when dusted over a wound, by reason of its action on this living tissue, probably preventing the exudation of serum, dead animal matter, the paradise of germ growth. So, again, with reference to the debated value of coagulants as dressings for root canals, which experimentally we may prove of doubtful value, and theoretically fail to see the use of, yet are probably more largely used than any other drug, and with beneficial results. Let us at once recognise that experiments are not in accord as to the self-limiting action of coagulants, let us admit, for argument's sake, that Dr. Harlan's theory is right, and thus waive further discussion, still we would ask "Are the conditions of the experiment and of the practical use of coagulants the same? "Is the theoretical conception of what we require root dressings to do in accord with what we actually need them to do?" We think not. Leaving, as out of court, those cases in which the desideratum is a free drain down the pulp cavity, and which a mass of coagulum will obviously obstruct, the conception of a dead tooth is a cavity full of septic *dèbris*, surrounded by a wall permeated by fine tubes full of similar material, which tubes are in direct connection with a vascular membrane. Yet this is an exaggeration of the actual, for, though undoubtedly dentine is permeated by tubes, and equally surely the cells of the periosteum are placed through the cement corpuscles in communication with the protoplasmic contents of the tubes; yet these tubes and their communications are microscopical in size, so much so that the permeability of a tooth to fluids can only be shown with difficulty. Even granting that micro-organisms fill the tubes in the dentine of the root of a dead tooth, they will, in the absence of a *vis a tergo* be scarcely likely to find their way into the periosteum. Suppose the root tightly filled, whence comes the propelling force? There is nothing. On what, too, shall these germs live? Warmth they have, truly, but moisture and soft, dead animal matter have been removed or dried up by our filling. They are like an enemy with its baggage train intercepted and the communications broken. They cannot live, and they must be innocuous, for the moribund strugglers which the ingenious may fancy finding their way through into the periosteum, will get anything but a kindly reception from this vascular tissue. Given a clean pulp cavity, well filled, we believe that the cementum and periosteum will not suffer inconvenience or harm. We, personally, reserve our sympathy for the germs bottled up in the dentinal tubules.—EDITOR, *Dental Record.*

A GREATER NEED FOR PROFESSIONAL DIGNITY.

The distinctions drawn in the various positions in life may be of an arbitrary character, yet they are based on experience. That they are misused is true, and individuals are set off into classes from which it is difficult, if not impossible, to rise, as in the older civilizations. This is the extreme abuse of what was originally a natural and, without doubt, a serviceabe division.

Training and association have largely to do with the positions occupied in newly-settled communities. The child of poverty and coarse associations may, by the force and upward tendency of education and its refining influence, reach a station in life in the New World not possible in the more conservative elements of the Old.

All this is well understood, but while education and refining environments may do much to raise to a higher class, it cannot obliterate the strain of inheritance in one generation. This remains and will show itself as plainly in the millionaire as in the lowly-born. It may require generations of wealth to produce that love of refinement so perceptible in lives of quiet, unselfish work, so frequently seen in what are termed the middle-class families.

We are led to these prefatory remarks by the observation that the so-called dental profession is in many respects not what he ought to be when viewed as a whole. There are wide differences in individuals, some with a full appreciation of the importance and dignity of their calling, while there is another class who, while appreciating the work and necessity of ethical culture to maintain its integrity, is still filled with the leaven of earlier surroundings and give to the work and its associative efforts a degree of unrefinement at once unpleasant and oftentimes shocking. There is still a lower class without the slightest regard for the higher life, and this will sacrifice ethics, the good opinions of their fellows, for temporary emoluments. These different classes shade off into each other and have no clearly-defined limitations. While this is true of dentistry, it is by no means confined to it as a profession, but all, theology, medicine, law, and the continually developing newer divisions, have the same unpleasant combinations and perhaps to an equal extent as our own calling. It is not our purpose, however, to labor outside of our own vineyard.

The result of this commingling of the coarser with the more refined produces naturally inharmonious elements. We see it everywhere, and it is possible that there may be no immediate hope of improvement. It may certainly be laid down as a law of professional life that the individual who fails to aspire to the highest qualities attainable, in manners, language, and correct life, is unworthy to wear the professional mantle no matter how many degrees he may have earned from the schools.

The ill-bred man may not render himself specially obnoxious in his own office, but patients will mark a difference, and while for the sake of skill they may bear with unrefinement, it in the end not only tends to individual loss but casts a dark shadow upon the profession.

It was through this evil, as much as a lack of thorough medical training, that led dentists of a former era to be regarded with contempt by medical men and with very little respect by the community at large. As this changed there has arisen a higher respect and a more intelligent appreciation of the service performed, and just in proportion as this refinement is increased will dentistry hold a more advanced position.

The evidence of this unrefined life is more to be found in journals devoted to the interest of trade as distinct from that felt for the profession. The criticism we make does not apply to the higher class of journals of the trade series ; indeed, in several it has no place, but in some recent additions the violations of professional good breeding are painfully apparent. Witticisms, whether new or old, have no place in a dental journal, nor should doggerel rhymes and anecdotes from the newspapers relating to dentistry be recognized.

Professional life is a serious thing. There is no time in connection with it for the frivolities common in the jar and tumult of ordinary trade. These may have a proper place in the social whirl, but never in a journal devoted to the higher training of its readers

The same criticism can be applied, and with equal force, to our associations. It is one of the burdens of editors that they are forced to eliminate all these labored witticisms and out-of-place remarks. If speakers would confine themselves to the subject, and stop when they have finished, there would be a higher standard very soon developed. The funny man has no place in meetings of a scientific character, for these gatherings mean an attempt to find truth, and there is nothing so inappropriate in a serious effort in this direction as the jester's wit, for it is always "much more easy to raise a laugh than to excite admiration by quick wisdom."

Editors of reports of dental societies should unsparingly cut out all irrelevant remarks. If this were faithfully done, dental societies would not be long burdened by such misplaced effusions.

Journals that persist in lowering the standards of dignified expression should be permitted to find their own level, and that will be among those who flourish behind the golden tooth attached to the iron rod, for they can have no place among the self-respecting readers of a dignified literature.—Editor *International Dental Journal.*

A CURIOUS CONTENTION.

A writer in a recent issue of a transatlantic dental journal, criticising a review published therein, concludes his letter with a very suggestive sentence. It is immaterial to our point to say more than that the matter in dispute is the correctness or otherwise of Heitzmann's description of microscopical observations; there are many doubters, and to these writes this reviewer of reviews: "Heitzmann's answer to doubt is the only correct one—come and see. Come to his laboratory and learn how to see. Anyone who is unable to see the reticulum does not know how to see it. He that will not accept Heitzmann's drawings will not accept even the coming photographs, and probably he that will not accept these evidences is not willing to go to the expense of time and trouble to learn how to see for himself; certainly that individual expense should not be all saddled on Heitzmann or Bödecker, *et al.*" The concluding sentence of this quotation contains two distinct statements; the first is but a new version of the proverb "None are so blind as those who will not see," and this, being an accepted postulate, we will dismiss, but the second is really an inverted form of the proposition that the observer or discoverer shall not be required to prove his case gratuitously. From this we are led to enquire, what does science demand of its disciples? What help may one worker in the bye-paths of science reasonably expect from another who may have preceded him? We feel we are not arguing a personal question; it is an abstract one with, perhaps, the personal application that we are engaged in the often needed task of defending distinguished authors from their friends. There are always two aspects to a scientific question, the one commercial, the other abstract. It would be silly to deny the commercial side; few of us, however fully imbued with professional instincts and feelings as regards matters of our own immediate sphere, would forego the reward of a discovery in other fields, say in chemistry; but even here it is the commercial application of the fact rather than the fact itself which we would surround with that mystery which may be needed to prevent competition. Our better nature revels in a discovery for its own sake. It is a step nearer truth—the truth of the great mysteries—Nature, life, death, disease. Money is a mere bagatelle compared to these; to merely help towards this great end is reward enough. There can be no commercial aspect to questions like these, unless we would be classed with the soothsayer and the gipsy vagrant. Proof is the great end : to prove that which we say is true. Money may be needed, our own if we have it, other peoples' if we have not. Money to conduct experiments, money to live on while we work, or when we are too old to work, money to publish our work. If the expense of obtaining proofs of this or any other discovery is too great for individual effort, then by all manner of means let those who are interested, lend a helping hand, not to prove it to Tom, Dick, or Harry, but to advanced workers in this field, whose opinion will carry conviction to those less able to form one of their own. A man is bound to prove his discovery or theory, to prove he speaks the truth ; because impartial minds may help him to detect errors ; because he owes more to previous workers in the same field, who have provided him with the means of work, and the groundwork on which to build, than the work of a single life can possibly repay ; because it will bring lasting honors to himself. —Editor *Dental Record.*

RECENT FACTS AS TO HUMAN TEETH.

From the facts developed in this investigation, it seems that the following conclusions may be summarized.

The teeth are strongest in youth and early adult age, diminishing somewhat in strength with advancing age.

Teeth that have lost their pulps and have become discolored lose strength in a marked degree, apparently from a deterioration of the organic matrix.

Teeth that have become badly worn from mastication, and in which the pulps become so much calcified as to cut off the nutrition of the crown portions of the dentine, lose strength, apparently from deterioration of the organic matrix.

Teeth of old people, and especially those in which much calcification of the pulps occurs, deteriorate in strength.

There is no basis for the supposition that the teeth of children under the age of twelve years are *too soft to receive metallic fillings.*

Differences in density or in the percentage of lime-salts in the teeth is not the controlling factor in the strength of the teeth, nor their hardness, this seeming to depend upon the condition of the organic matrix.

Differences in the strength of the teeth have no influence as to their liability to caries. Differences in the density, or in the percentage of lime-salts in the teeth, have no influence as to their liability to caries.

The active cause of caries is a thing apart from the teeth themselves, acting upon them from without, and, from a consideration of the facts thus far developed, the logical inference is, that the cause of the differences in the liability of individuals to caries of the teeth is something in the constitution. operating through the oral fluids, and acting upon the active cause of caries, hindering, or intensifying, its effects.

Caries of the teeth is not dependent upon any condition of the tissues of the teeth, but on conditions of their environment.

Imperfections of the teeth, such as pits, fissures, rough or uneven surfaces, and bad forms of interproximate contact, are causes of caries *only in the sense of giving opportunity for the action of the causes that induce caries.*

The objects to be attained in filling teeth are the perfect exclusion of the causes of caries from the tissues by sealing the cavity, *and securing such form as will prevent lodgments of debris about the margins of the filling*, and thus prevent the further action of the cause of caries.

There is no basis for the supposition that some teeth are too soft, or too poorly calcified, to bear filling with gold, or other metal in use for that purpose, since all are found to be abundantly strong.

There is no basis for the selection and adaptation of filling-materials to soft teeth, hard teeth, frail teeth (in structure), or poorly-calcified teeth. What basis there may be in the *conditions surrounding the teeth* for the selection and adaptation of filling-materials must be left to future developments to discover.

With our present knowledge, the only basis for the selection and adaptation of filling-materials to classes of cases is the individual operator's judgment as to which he can so manipulate as *to make the most perfect filling*, considering the circumstances, his own skill, and the durability of materials.

There is no basis for the supposition that calcic inflammation of the peridental membranes or phagedenic pericementitis (so-called pyorrhea) attacks persons who have dense teeth in preference to those whose teeth are less dense

There is no basis for the treatment of pregnant women medicinally with the view of furnishing lime-salts to prevent the softening of their teeth, or with the view of producing better calcified teeth in their offspring.—Black (G. V.) *Dental Cosmos.*

ALUMINUM AS A BASE FOR ARTIFICIAL DENTURES.

Aluminum has been used in dentistry for about twenty-five years, but owing to its many peculiarities its employment has been circumscribed. Like amalgam it has had its ups and downs, and like amalgam it is here to stay. The many "downs" which it has received have caused the large majority of dentists to give it a wide berth, but the recent production of pure aluminum has done away with the old cavil that it disintegrates in the mouth, and a new trouble has appeared upon its horizon It is urged that the metal is soft and very pliable after it is swaged. It is concerning this objection that I wish specially to speak. Improper annealing is the usual cause of soft, pliable plates, the usual method being to coat the metal with sweet oil, then to hold it in the flame of a Bunsen burner until the oil has burned off, when it is immediately plunged into cold water. This softens the metal, but leaves a surface tension which is objectionable at this stage of the manipulation, for it makes re-annealing necessary before the swaging is finished. This again softens the metal, and as it has already taken on the shape of the intended plate, there is not enough swaging and manipulating to be done to temper it again, while if it is not annealed the metal becomes so rigid that perfect adaptation and the avoiding of wrinkles in the plate are almost impossible.

The surface tension is accounted for as follows: Before annealing the metal the crystals are all elongated by the rolling of it into sheets. When the metal is heated for the annealing, the crystals tend to assume their original molecular arrangement, but when the metal is plunged into the cold water the molecules become stretched in taking their normal positions, so that the outer surface or the outer layer of the crystals has assumed this surface tension.

Another proof that the molecules change positions and shape, can be observed if one will try the metal in a gauge before and after annealing. If it is twenty-four before annealing, it will be found to be twenty-five afterwards. If one would avoid this surface tension, he should be more careful about annealing and swaging. After the metal has been coated with oil, and this burned off in the Bunsen flame, it should be allowed to cool down gradually. It will be found that it takes some time to do this sufficiently to permit handling, but if it be carefully attended to it will permit a perfect molecular arrangement, and it will be found that the metal is much softer than when annealed in the old way. It will also have increased in thickness from a twenty-five guage to a very tight twenty-four.

In swaging the metal the palatal portion should be swaged first. This can most easily be done by banking the die with molding sand up to the ridge, and simply making a counter die of the palatal portion. Swage from this, and then hammer the metal over the ridge into place as nearly as possible. It will be found that it works very easily, and that wrinkles are handled with the utmost ease. After it is well beaten to place, a new counter die is run, as in the ordinary way. Finish swaging from this. It will be found that the metal is very materially condensed between the die and the counter die. Another reason why the metal is found too soft, is that the vulcanizing is done at a point that is too high. A temperature of 350° will soften the metal. Where vulcanizing is done at 320°, the inside of the vulcanizer will be at least 340°, and should the vulcanizer run up a few degrees above 320°, as is often the case, the metal will come out soft. The vulcanizing should be done at 300°, for an hour and thirty minutes.

In conclusion, let me suggest that the metal be placed so that the former grain shall be transverse, or from heel to heel.—JOHNSON (E. R.), *Dental Practitioner and Advertiser.*

A POTATO RETORT.—A miner in Australia who was obtaining fine gold by sluicing, was asked how he saved it. He replied that he employed the common amalgamation process, but used a novel and ingenious retort for the purpose. After amalgamating with quick silver, "I get a potato," said the miner, "cut off one end, and scoop out a cavity in it large enough to take my ball of amalgam. I next take a spade or piece of flat iron, and place the potato with the cut side down. As the amalgam gets hot the 'silver' evaporates and goes all through the potato ; but it can't get through the skin. When it is cool, I have my gold button on the spade and my 'silver' all in fine globules in the potato. I break that potato up under water and I have all my 'silver.'"—*Philadelphia Ledger.*

Maxim, the gun-man, in discussing England's decline as a manufacturing nation, says: "If a man wants a square that is square he has no choice in the matter, but must of necessity but one which is made in the United States because there are no squares that are square made for sale in England."

THE
ODONTOGRAPHIC JOURNAL

CONDUCTOR'S DEPARTMENT.

EFFERVESCENCE AFTER PYROZONE NOT NECESSARILY A SIGN OF THE PRESENCE OF PUS.

In reading the discussions of pyrozone in general practice and in dentistry, we find it spoken of as "a diagnostic agent for the detection of pus, causing instant effervescence . . . thus of value as a diagnostic agent in the detection of pus in deep-seated wounds." It is said also that "purulent matter possesses the power of liberating the oxygen from the solution, as evidenced by the ebulition of bubbles of gas." Cotton saturated with pyrozone was let remain "until the appearance of foam indicated that pus had been found." Again, "when you spray a set of teeth, you will be surprised to see the amount of pus that will appear around the sides of the teeth." Still another gentleman speaks of it as a "reliable and an infallable detector of pus." From which, together with the context, we conclude that effervescence is proof of the presence of pus.

To dispose of this notion, we suggest a repetition and amplification of the following experiments:

1st. Saliva from a pus-free patient was drained into a test-tube and let stand until the natural foam had disappeared. A few drops of 3 per cent. pyrozone were then added, with active effervescence as a result.

2d. Mucus from the nares of a small boy with a "cold in the head" was collected in a test-tube, pyrozone added, with a result similar to that obtained from the treatment of saliva. Mucus from the nares of another patient was spread upon a sheet of glass and sprayed with pyrozone from the ordinary atomizer. Instantly the film of mucus became apaque; in other words, it effervesced.

3d A test-tube of milk was treated with pyrozone, with the result that it became effervescent, but not very actively so. Within five minutes, however, the foam constituted the upper fourth of the white contents of the tube. Repetition of the test made the time and degree of effervescence dependent more or less upon the richness of the secretion.

4th. The teeth and gums of a pus-free patient, who had lunched at the usual hour but had not made any attempt to remove the remains of the meal, were sprayed six hours after with pyrozone, and as a result effervescence showed itself on all sides. Mucus, saliva, and organic matter in a more or less active state of fermentation, constituted the coating of both teeth and gums.

From these tests it is conclusively shown that while pus may be present, effervescence is not necessarily proof of the fact. Peroxide of hydrogen gave not very dissimilar results.

THE HARRIS MEMORIAL FUND.

A movement is now in progress to insure a mortuary tribute to the memory of one of the greatest names in the annals of dentistry. It is proposed to adorn his neglected tomb at Mount Olivet Cemetary with a monumental testimonial worthy of his name and fame.

Mr. Ernest W. Keyser, the talented Baltimore sculptor now in Paris, has modelled a remarkably faithful portrait bust of Dr. Harris and executed designs intended for a monument to be erected over his grave.

It is also in contemplation that should sufficient funds be realized a memorial tablet containing an alto relievo bronze bust of Dr. Harris be placed in both the Baltimore College of Dental Surgery and the Dental Department of the University of Maryland.

It is believed that the necessary funds can be obtained through voluntary subscriptions from the dental profession. The Snowden & Cowman Manufacturing Company of Baltimore has kindly consented to act as custodian of the fund.

PYROZONE PLUS MAGNESIA FOR GREEN STAIN.

As a bleachant *from within the tooth* pyrozone seems to be the only thing now known to the profession that will restore permanently a pulpless, and therefore ("therefore" in a majority of cases) discolored tooth, to a shade approaching that of its antepulpless days. This property of pyrozone has been taken advantage of and discussed to that extent that pretty much everything claimed for it is conceded.

As a decolorizer *from without* less is known and as a consequence less is said of it. The removal of stains, green or other, mechanically, involves the loss of more or less of the tooth, which robs the superficial portion of its finest structure and its lustre, and paves the way for a speedy return of a deeper stain with necessary repetitions of the process of removal until the child has passed the age at which the stain is most common, also the conditions of which green stain is simply an indication and of no more consequence than if it were red stain or blue. To avoid this mechanical mutilation, which is urged chiefly because of the offensiveness of the stain to the eye, two of what appear to be purely chemical processes have been resorted to: 1st. The application to the stained surface of iodin, followed by a weak solution of aqua ammonia (or aromatic spirits of ammonia,) repeating the operation at the same or a subsequent sitting until the stain disappears. 2d. Degreasing the teeth by the application on cotton of ammonia or bicarbonate of soda, followed by clear water, and this by 25 per cent. pyrozone well rubbed in with a cotton or leather buff, followed in turn by bicarbonate of soda to neutralize the slight acidity and mitigate the occasionally caustic effect on the soft tissues. This latter treatment is effective to a remarkable degree, usually acting promptly and always without injury to the tooth, either as to structure or lustre, which we have proven repeatedly in the mouth, also by immersing teeth in caustic pyrozone for two weeks at a time.

At a recent meeting of the Rochester Dental Society, Dr. Edington reported the mechanical removal of green stain of "deepest dye" from every tooth in the mouth of a young miss, and its utter failure to reappear after a period of several months. He accounts for this by the diligent use of milk of magnesia, which unboubtedly corrected the conditions that made the deposit of the pigment possible. This suggests what may be characterized as ideal treatment: The use of pyrozone to take off the stain, and milk of magnesia to keep it off.

TRANSLATION OF BUFFALO'S DIPLOMA.

The Chancellor, Vice-Chancellor, Curators and Professors of

THE UNIVERSITY OF BUFFALO,

To all to whom these letters may come, Greeting:

Be it known that .... having shown himself possessed of benevolence, zeal and virtue, and having solemnly pledged himself in all things to conform to the laws and usages that govern reputable professional life, has been deemed worthy to be advanced to the grade of

. . . *Doctor in Dentistry.* . . .

Wherefore, he having been duly examined by us and found qualified, having passed the requisite time in study and meditation, and having given other and necessary proofs of his proficiency, we do by the power vested in us hereby confer upon him the degree of

Doctor of Dental Surgery,

with all the privileges, immunities and dignities therunto belonging.

In Testimony of which we have, under the seal of our University, this......day of....................One Thousand Eight Hundred and Ninety....A. D., caused to be issued these letters, and the signature of the Governors to be appended.

....

UNIVERSITY OF BUFFALO—DENTAL DEPARTMENT.

The third annual commencement exercises were held in connection with the Departments of Medicine and Pharmacy, April 30th, 1895. After thorough examination by the Board of Curators, including the State Dental Examining Board, the Chancellor, upon their recommendation, conferred the degree of Doctor of Dental Surgery upon the following members of the senior class :

Will. B Bartlett, Charles F. Bunbury, Gerald G. Burns, Charles A. Bradshaw, Fred. E. Cloud, Thomas J. Dorland, Charles E. Flagg, Frederic J. Gieser, William G. Gowland, Perry C. Hammersmith, Frank L. Haynes, Albert Heinrich, Lott M. Howder, George L. Hussong, Harry B. Huver, Lloyd S. Ingalls, William E. Jenney, Clint W. La Salle, Charles T. Lewis, John J. Madden, Henry J. McLellan, Alfred E. Mimmack, Bertram A. Moyer, Thomas C. Phillips, Miss Annette Rankin, Albert B. Rieger, Frank M. Rowland, John W. Steele, Harry G. Tripp, Burdette W. Whipple.

Whole number of matriculates for the session, 160.

Dr. Fred. J. Gieser, one of the clearest-headed men of the senior class of '95, was handsomely caned by his fellow Barrettitonians. In addition to personal duties he saddled himself with any amount of quiz and coach work.

Dr. Madden, one of the recent graduates, will act as adjunct in anatomy and histology this coming winter.

Dr. Squires has been advanced to the full professorship of regional anatomy.

Drs. L. S. Ingalls, C. E. Flagg and F. E. Cloud, (all '95,) have been similarly honored.

Dr. Hofheinz, of Rochester, has been appointed instructor in operative dentistry. In him the college has made an aquisition indeed.

Dr. F. E. Howard's "antiseptic balsam varnish" for anchoring gold and gutta-percha fillings, lining cavities, etc., is in the market.

PERSONAL

Now watch out for your cherry trees. The *Review* says Dr. Ottolengin has dropped his appendix.

Dr. Sibley ('94, Buffalo,) is prospering "for sure." Proof of it is found in the fact that he has just gone and wed.

Dr. Brophy has had a few more letters of the alphabet appended to his name. This time LL. D., from Lake Forest University.

Dr. J. B. Ernsmere (U. of P.,) of Buffalo, has gone to housekeeping. When a dentist becomes "established", it seems perfectly natural that he should look about for someone to share his good fortune. This occured in June, of course.

Not long ago Prof. Taft was presented by the Odontological Society, of Cincinnati, a "Star of the Morning" borne in uplifted hand of a bronze statue of exquisite workmanship, all in fitting appreciation of his efforts in behalf of dentistry for a period of fifty years. May they sing together as of old, and as joyously for a fifty yet to come.

SOCIETIES.

The National Association of Dental Examiners will meet, also at Asbury Park, August 5th, at 10 o'clock.

The American Association for the advancement of science will meet at Springfield, Mass., August 28th to September 7th.

The National Association of Dental Faculties will meet at Asbury Park, August 3d, at 10 o'clock. The executive committee will meet just 24 hours earlier.

The New Jersey State Dental Society will meet at Rasbury Park, August 1st, 2d, 3d. Fifteen or more papers will be read, a greater number of clinics given, and a series of exhibits made, that will be alike creditable to the society and the occasion.

The committees appointed by the State Associations of Iowa, Nebraska, Colorado, Kansas and Missouri to arrange for the Interstate dental meeting to be held at Excelsior Springs in May, 1896, will meet at Perth Springs, Mo., July 10th, 1895. A full attendance is desired. J. P. Root, Chairman; S. C. A. Ruby, Secretary.

At the meeting of the Dental Society of the State of New York, held May 8th and 9th, 1895, the following officers for the ensuing year were elected: President, Dr. H. J. Burkhart, Batavia; vice-president, Dr. C. K. VanVleck, Hudson; secretary, Dr. C. S. Butler, Buffalo; treasurer, Dr. J. I. Hart, New York; correspondent, Dr. R. Ottolengui, New York.

The thirty-first annual meeting of the Illinois State Dental Society was held at Galesburg, May 14th to 17th, 1895. About 200 were in attendance. The following named persons were elected officers for the ensuing year: President, Walter A. Stevens, of Chicago; vice-president, C. R. Taylor, of Streator; secretary, Louis Ottofy, of Chicago; treasurer, Edgar D. Swain, of Chicago; librarian, J. R. Rayburn, of Fairbury; chairman of executive committee, W. A. Johnston, of Peoria. The next meeting will be held at Springfield, May 12th to 15th, 1896.

The American Microscopical Society will hold its annual meeting at Ithaca, hearsay making the dates next month the 21st, 22d and 23d. Circulars of information do not arrive volumniously, hence the meagreness of this announcement. Prof. Gage, of Cornell, is President, and with Prof. Rowell, of the same institution, as his second, the meeting is more than likely to prove a great success. The laboratories of the University will become a veritable Mecca to those whose tastes and work run that way. Society management will form one of the topics for a discussion that cannot result otherwise than in the strengthening and popularizing of the whole body.

The American Dental Association will hold its next meeting at Asbury Park, Tuesday, August 6th, 1895. It is the privilege and duty of each State and Local Society to appoint and send delegates to the American Association. State and Local Societies which have adopted substantially the same Code of Ethics as that presented for members of the American Dental Association are entitled to one representative for every five members and fractional part thereof. Blank certificates for delegates may be had on application to the

Corresponding Secretary, Emma E. Chase, 3334 Washington avenue, St. Louis. Many questions of interest will come up for discussion at this meeting, and every Dental Society in the United States should be fully represented.

OUR CONTENTS IN PART.

The reticular striction of protoplasn is still to the fore. A phase or two of it are discussed briefly in two of our extracts.

How to economize time and obtain adequate compensation therefor is a problem old as dentistry. Dr. Crouse's suggestions indicate the way.

The *Record's* little discussion of experiments versus experience is timely. It has a broader application than to the special subject that called it out.

The nature of the transparent zone in dental casies is not so easily determined abroad as here. Angels and some of our British friends tread alike with due caution.

The special attention of our readers is called to Dr. Allen's address to students about to begin practice. Many of the same things have been said by others, but never in such catching phrase.

Dr. Smith's remark to the VIIth Society apply too well elsewhere. Society work should fall equally on the membership, and every man made to feel his personal responsibility for the standing of his society and the success of its meetings. The younger talent should be forced to the front.

Elsewhere the new state law (New York) is given in full. Its debatable features are by no means few, and unless qualified by further legislation in the very near future, emasculation may result, if not loss of the whole enactment, body as well as spirit. Some one has said, "A good thing should be relatively good, but not too good."

The Chas. H. Phillips Chemical Company captured the dental profession some time ago with "Milk of Magnesia," and is now following up that achievement with "Syrup of Wheat Phosphates," a constructive food in perfect and permanent solution that is palatable.

DEATHS.

Members of the profession, especially in New York State, will be grieved to hear of the death of Dr. Edwin C. Baxter, of Albany, long an esteemed member of the Third and State dental societies, and since the death of Dr. French, of Troy, one of the State Board af Censors. He was also a curator of the University of Buffalo.

Professionally Dr. Baxter was well known throughout the State, and as a practitioner enjoyed the confidence and esteem of a large and lucrative clientele. Socially he was factor at the capitol, and in legislative matters exerted himself effectively in the best interests of dentistry. July 14th was the date of death, typhoid fever the cause. Particulars are not at hand, but this latest of a series of deaths from the same specific disease may be fairly charged against a polluted water supply.

Dr. John J. R. Patrick died at his home, Bellville, Ill., April 10th, He came to America from England in '42 and in '48 began work as a goldsmith. Subsequently he attended medical lectures, and then turned to dentistry, in the scientific pursuit of which he made for himself an international reputation. Among his achievements that the general reader will recall, may be specially mentioned a system of regulating and the collection of prehistoric crania in possession of the Missouri Historical Society.

Dr. A. C. Hawes, of New York, one of the earliest and most esteemed members of the N. Y Odontological Society, a founder of the First District Society, and an original member and early treasurer of the State Society, died April past. The tributes to his memory by his associates have been many and commensurate with his exceptional worth.

PELLETS.

Dr. Chupein mounts disks and points with oxy-phosphate. Good thing.

Thirty-eight dental shools report 1196 graduates for the year just closed.

"The worst thing I have against that tooth," said a patient, "is the one next to it."

"I can come any day but tuesday, Doctor; I paint that day." And then she colored just the least bit.

An attempt is now making to prove milk unfit as an adult food. Wherewith shall some of the grown-up babes and sucklings be fed ?

Anyone having odd copies of the *Dental Record* (England) to dispose of, may hear of a would-be purchaser by addressing this journal.

Every little while the impassioned speaker refers to Cæsar's wife, apparently oblivious of the fact that the lady has been very dead these many years.

Dr. Cowan, of Geneseo, "nicks" with a file or stone the shafts of his root drills so that in case of breakage he has enough to grasp for removal with pliers.

A new work on operative dentistry is projected by Dr. Kirk of the *Cosmos*. Its chapters will be interdependent, and the whole subject treated with all possible unity of purpose.

Bertillon is credited with the statement that though medical men do not apparently live longer than those of other callings, their children enjoy a singular immunity from disease.

Disease germs have got into the telephone. The special question in dispute is whether they come over or through the wire, or from the fellow who last fanned the instrument with his ear.

Pneumonia, according to Osler, is a self-limited disease, and runs its course uninfluenced in any way by medicine—that it can neither be aborted nor cut short by any known means at our command.

He wanted to change his profession and to that end thought he might make a beginning if he could get hold of the right kind of a book. "Dentistry in six easy lessons," he thought might answer.

The doings of the Antiseptic Club have been duly reported by Albert Abrams, a medic of San Francis. Sterile pens, aseptic ink, disinfected paper and antiseptic binding characterize its make-up.

Student (wrestling with answer to question): "Why, its er—er—ah, its—er—er"

Professor: "Don't laugh, gentlemen; to err is human."—*Exchange.*

Col. Pope is still spending time and money in the interests of good roads Wheelmen among dentists—and their name is getting to be legion—are with him to the full extent of their influence and financial ability.

The famous clown, Grimaldi, "clowned by night and followed the occupation of a dentist by day." History says, he did both well. His remains lie in the old churchyard of St. James, Pentonville Road.

Send to Funk & Wagnalls Company, publishers, New York, for reading matter in regard to their *Standard Dictionary;* and later for a copy of the work itself. For convenience of handling get the two-volume edition.

Patti says to all would-be divas who seek her counsel: "You must learn to work at your trade before you can ever hope to become an artist in your art." The lads who would skip the laboratory should take heed.

The *Pacific Druggist and Physician* does better than many of its contemporaries in that it provides generously of its space for extracts from dental periodicals. Dr. W. K. Scott, of San Francisco, has charge of this department.

Verily the dog days are upon us. In the June and July issues of certain of our exchanges we find such terms as *glare*, *growl*, *snarl*, *bark*, *bite*. In the words of a great pacificator,—"Gentlemen, gentlemen, I beg of you, desist!"

Patient (for whom the dentist had recently adjusted an upper denture): "The plate's a little bit loose, Doctor, but perhaps that's as it should be."

"Yes, yes; it ought not to be *too* tight."

The *Buffalo Druggist* is a new publication devoted to the advancement of pharmacy and the interests of the drug trade. Its grouping of views of the University of Buffalo, interior and outerior, is unique. The plates might be used to advantage by one or more of the departments that issue illustrated announcements.

Some of our friends tell us that when we made the announcement that a certain manufacturing company had "settled the cocain nostrum business for all time," we tolled the bell too soon. This was because the so-called signs of death were not conclusive. The fact is, a thing must be dead a long time before we can be certain that it is dead at all.

At a monthly meeting of the Mud Valley Association, Dr. Von-Kranch reported a remarkable case: At 10:23 of the previous day he had filled the inferior left second molar. mesio-buccal surfaces and angle, with a high-grade amalgam, and at 4:17 that afternoon, exactly four hours and fifty-four minutes subsequent to and because of the operation, the patient fell from his bicycle.

The heavy tin foil used to cap the corks of good champagne bottles is about the right thickness to relieve hard spots in the palate. When doubled it answers well for air chambers. The rubber sheds the lacquered side perfectly. It might be said in this connection for the benefit of the dental reader that champagne is the generic term for "effervescent or so-called sparkling wine."

The Barrettonian Society of the Buffalo school is a great institution. Its meeting the Saturday before commencement was a rouser. Members made speeches, gave recitations, sang songs, danced the clog, listened to the college orchestra, waltzed, polked and quadrilled *a la* stag till midnight. It was a night off in earnest, and while the boys got the bulk of the fun, those of greater dignity didn't miss much of it.

The *Dental Record's* reviewer of Bödecker's *Anatomy and Pathology of the Teeth* is as full of doubt as ever of some things. He not only questions the correctness of the interpretation put upon the reticular structure, but the very existence of the structure itself. Advice of the unsolicited variety is worth about what it costs, nevertheless we warn him that he had better "watch out." The multiplication of Thomases is neither lucrative nor wholly free from danger.

Dr. B. G. Saunders, of Rochester, reports a rare case: After long and unsuccessful treatment of inflammation and suppuration about a second superior bicuspid, he extracted it. There was improvement, but no cure. Later he removed from the bottom of the same alveolus the second deciduous molar, which put an end to the patient's trouble. Suppressed deciduous teeth are not over common, but vertical transposition of members of the two sets is rare indeed.

One of the speakers at a sanitary convention on the Pacific coast said: "It does not follow because a man or woman is a graduate physician that he or she will be a good teacher of hygiene. It is coming to be an independent subject and requires careful studv in addition to the professional study of medicine. It requires a special study in itself." This translated means that when in need of medical advice one should go to a physician; when the question is one of sanitation, to a sanitarian or sanitary engineer.

Reading matter has become so cheap that to be distinguished one has only to be mis—or, perhaps, we had better say, un—informed. To read everything is impossible; much of anything a task; hence the coming of digests—literary, scientific, even dental, and these are the hope if not the salvation of the busy man from that form of "innocuous desuetude" whose further qualifying term is "mental." *The Literary Digest*, published by Funk & Wagnalls Company, is an up-to-date weekly of this class, one that keeps the reader in touch with the world without undue expenditure of time.

In the course of a plea for succintness in scientific papers, the editor of the *Pacific Druggist and Physician* shows to what degree condensation may be carried, by reducing to a paragraph of six lines all of value contained in an article of forty-nine, or one-half the space of this exchange's generous page. But if everything offered for publication, and most of which is published, were thus "succincted," what would become of the "original communication" department of our periodicals,—dental periodicals for example. The simple fact of the matter is that it is much easier to write long than short, diffusely than concisely; to bury a thought than vivify it.

Pseudo-scientific killing by electricity has had a further vindication at Sing Sing prison in the case of Dr. Buchanan, the alleged wife murderer. The experts "expressed their belief," as usual; but their knowledge of the matter was akin to that of people who were not there. A local paper voices the general opinion that electricity had mighty little to do directly with the death of the victim, and suggests that the term *Electrocution*, with which the State wrestled so successfully a few years since, be supplanted by *Autopsicution* as more in accord with the facts. Medical opinion is valuable, but not always on electrical subjects. This is a case of every man to his trade.

On the principle that misery loves company our sympathies are with the other dental fools that subscribed for a *Physician's, Dentist's and Druggist's Directory of the State of New York.* From this remarkable work we learn that there are 151 post-offices in New York State, at each of which may be found one or more dentists, and that New York City has 124 dentists, one of whom has practiced in Brooklyn these many years, but according to this book's say, doesn't live anywhere. The druggists and pharmacists of the State must be consoled too; they paid as well proportionately as dentists, but fared even worse. Buffalo leads the van with 28, Rochester has none (a great field of 147,000 people waiting for some one), New York City 2. If every black-face name in this alleged dental directory means $2.50, then it is time that some of us got into the business of making dollars; and there would seem to be no easier way than canvassing for and publishing directories of and for professional men.

An exchange refers to castration as an ideal conception of modern surgery. This may be true as far as surgery is concerned, but it is otherwise from the standpoint of the individual. Such an operation will conduce to a reversal of sexuality; in the woman it will be a Mr. (missed her) conception, and in a man a Miss (miss) conception. It is not our endeavor to detract from the brilliant conceptions of modern surgery, and we are prepared for almost anything. We would not be surprised if some intrepid surgeon would recommend castration as a means of acquiring immunity to infectious diseases or as a preliminary measure to an aseptic operation, on the principle of rendering the individual sterile. We will not question the advisability of having our ovaries removed, but when the testes are the organs at issue, we are disposed to hesitate before having our spheres of usefulness extirpated. Castration of the male for hypertrophy of the prostate gland is a new operation, and is apparently a successful one. Other methods of treatment, less severe, are moderately successful, and we are prone to asseverate that one sphere in a sack is worth two in a bottle.—Editor *Pacific Druggist and Physician.*

BOOKS.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION, 1893-4.

TRANSACTIONS OF THE NEW YORK ODONTOLOGICAL SOCIETY, 1894.

AGRICULTURAL EXPERIMENT STATION (Geneva, N. Y.). 12th annual report. Pp. 762.

A 200 page pamphlet on "The therapeutical applications of Peroxide of Hydrogen (medicinal), Glycozone and Hydrozone," by Charles Marchand, Chemist, ninth edition, may be had by addressing the author, at 28 Prince St., New York.

CATCHING'S COMPENDIUM OF PRACTICAL DENTISTRY, FOR 1894. By Dr. B. H. Catching, Atlanta, Ga.

The fact that this valuable compilation continues to appear is proof positive that the demand for it is legitimate. The present volume is very fully illustrated and seems to contain not only a greater number of articles but also a much greater variety from widely scattered sources.

TRANS. OF WORLD'S COLUMBIAN DENTAL CONGRESS. Two volumes. Pp. 1068.

One of the best gotten up transactions we have ever owned. Worn out type and poor paper were not about when these volumes were in process of printing. When we average what one says should have been omitted with what another says should have been inserted, we are persuaded that the work stands about right as to its contents and treatment.

ANTISEPSIS AND ANTISEPTICS. By Chas. M. Buchanan. Newark: The Terhune Company. Pp. 352.

A concise statement of the history of the subject from the earliest times to the present. The products of vital cellular and bacterial activity are discussed, also infection, susceptibility and immunity. The value of antiseptics, relative, in medicine and surgery, obstetrics and gynecology, and the essentials of antisepsis and asepsis are handled briefly but sufficiently for ready reference, which latter is a feature of the book.

THE TREATMENT OF WOUNDS, ULCERS, AND ABCESSES, by W. Watson Cheyne, M. B., F. R. C. S. etc. Philadelphia: Lea Bros. & Co., Pp. 188. In the discussion of his subject the author everywhere impresses the reader with the necessity of cleanliness; that suppuration occuring in a wound through unbroken skin means avoidable errors on the part of the surgeon, whether of manipulation, instruments or materials. He believes a thorough practical acquaintance with bacteriological methods of the first importance. Such acquaintance makes the manipulations necessary to keep bacteria out of wounds well-nigh automatic. While designed more particularly for the general surgeon, the specialist will find this little work full of valuable suggestions. The get-up is in keeping with the contents.

THE YEAR BOOK OF TREATMENT FOR 1895. Philadelphia: Lea Bros. & Co., Pp. 460. This is the eleventh issue of the YEAR-BOOK OF TREATMENT. It presents little, if any change of plan pursued heretofore, and but three changes in the staff of compilers and their specific subjects. It sifts the grain from the chaff and puts the busy man to a minimum of trouble to keep abreast of the essentials that relate to the treatment of disease. The chapter on gout by Dr. Garrod quotes Dr. Kirk, and otherwise adds materially to the discussion of a subject dear in the near past to many dentists. Anesthetics, by Dr. Buxton, will be found of special interest. Cocaine and nitrous oxide are treated at length, and a number of novelties in apparatus are illustrated and described. The book is of convenient form and well indexed both as to subject matter and authors.

BROOK FARM. Historic and Personal Memoirs. By John Thomas Codman, Boston: Arena Publishing Co. Pp. 335.

The dentist in literature is an ever increasing quantity, and now Dr. Codman, a member of the profession distinguished as well in other fields, has added materially to the obligation of dentistry to those who have or make the leisure to discuss other than purely professional subjects.

Brook Farm was an experiment, and a short-lived one at that; but it thrived long enough to make itself felt, not only in the immediate neighborhood of Boston, but throughout the country. Ripley, Curtis, Greeley, Channing, Parker, May, Clarke, Emerson, Dwight, are names associated with the movement or the agitation that lead to it,—some of them directly, others indirectly, seeing it through its quiet but eventful career. Our author became a farmer as a lad, doing his full share in the matter of both work and play, leaving to take up dentistry but a short time before the melting away and final disappearance of this unique community of persons and professions. He is one of the few survivors and the only one apparently to attempt the rescue of the history, the sayings and doings, of a most distinguished company of men and women. This has been done in a style at once simple, interesting and effective, and whether read from the historical standpoint or that of personal reminescence, it will be found highly instructive and entertaining.

THE

ODONTOGRAPHIC JOURNAL

VOL. XVI. *October*, 1895. NO. 3.

HYPNOTISM AS APPLIED TO DENTISTRY.

Hypnotism is the modern name for a physical condition which has been observed for many centuries.

It was known to the earliest races of Asia and among the Persian Magi, and to this day the Yogis and Fakirs of India throw themselves into a state of hypnotic ecstasy and reverie by fixation of the gaze.

It has been known by the names of Trance, Fascination, Magnetism, Mesmerism, Electrical Psychology, Animal Magnetism, Electro Biology, Braidism and Hypnotism, and the science in its remedial action is now called "Suggestive Therapeutics."

Down to near the end of the eighteenth century this condition was imperfectly recognized, yet about A. D. 1600, Von Helmont wrote a work on the Magnetic Cure of Wounds, and Kircher, in 1646, described catalepsy produced in animals

Mesmer, born in 1734, and graduated an M. D. in Vienna in 1766, a man of great ability and much learning, discovered methods of producing this hypnotic condition at will in a very large majority of cases. His theory was that a fluid passes from the operator to the patient, and vice versa, and through this medium the influence was transmitted and the effect produced. He called this a magnetic fluid, and for fifty years the theory of animal magnetism prevailed, and is still held by very many. Mesmer's popularity was so great that the public called the condition thus produced, mesmerism.

In 1778 Mesmer came to Paris and announced his discovery. He made many cures. Thousands flocked to him for treatment. He hypnotized as many as 8,000 in a single year. Mesmer's methods of conducting his clinic were open to criticism. Professional opinion did not sustain him, and shortly he left Paris in disgust. Later he returned. The government took notice of him and appointed a commission to examine his claims and practice, and offered him a life pension. He did not accept, but chose to return to Prussia, and there continued to practice his art until he died.

From 1780 to 1841 mesmerism ceased to claim public notice as a remedial agent, though individuals practiced it.

In 1812 the Prussian government sent Wolfart to Frauenfeld, where Mesmer had settled, to examine and report. Wolfart not only declared in favor of Mesmer, but adopted his practice in his hospital treatment.

In 1817 a law was passed in Prussia confining the use of magnetism to medical men.

In 1820 Du Potet began a series of observations at the Hotel Dieu, and in 1825 the French Academy of Medicine appointed a commission to examine the claims of animal magnetism. The report concludes thus: "Considered as the agent of physiological phenomena or as a therapeutic expedient, magnetism must take its place in the scheme of medical science, and consequently it should be practiced by physicians only."

John Elliotson used it in his practice in London in 1837. Dr. James Esdaile, in 1845, had in Australia made a record of 100 cases of anæsthesia for surgical operations, when the English government placed him in charge of a hospital, and in 1851 he had completed a record of 261 cases of complete insensibility to pain in severe surgical operations, by the use of hypnotism.

In 1841, James Braid, of London, examined into the subject and experimented with it. He became satisfied that no magnetic or other fluid was concerned in the matter, but it was simply a condition of the patient, induced by outward circumstances, suggesting to him this state. To rid the science of all personality, he proposed the term hypnotism, from hypnos, sleep, and since that time it has been called by that name. There was for a while a disposition to call it Braidism, but it did not obtain. In 1843, Dr. Braid published a work on hypnotism and continued to practice the art. Also in this year, Dr. Joly, of London, amputated an arm painlessly by means of hypnotic suggestions, and the great Liston made use of it successfully, and Velpeau and Broca reported that they had employed hypnotism satisfactorily in twenty-four operations.

M. Liebault, of Nancy, near Paris, had a copy of Braid's book fall into his hands. He studied it, believed in it, and in 1860 opened a clinic and practiced the art among the poor of his village. He soon found that audible suggestion increased his success, and he soon demonstrated that suggestion was the key to all remedial effects of hypnotism, and if enforced by the voice through the auditory nerve, it was made much more effective than without. This came to be his constant practice, and is to-day the theory upon which all hypnotists act. Braid did not fully recognize *suggestion* as the cause of the cures, and hence did not seem to find the key to so complete and uniform success as has been since obtained.

While Braid may be considered the father of modern hypnotism, Liebault is the one who took the child, watched its growth, educated it, perfected it, and put it before the profession full grown to the stature of a man and entitled to the name and rank of a science.

For twenty years Liebault continued to practice hypnotism, quietly going his own way, looked upon by the profession as a crank and passed by with a slight.

But Liebault's continued success compelled attention, and in 1881 M. Dumont and Prof. Bernheim, of the hospital at Nancy, attended his clinic, studied his methods and witnessed his success. Prof. Bernheim became convinced that there was something of value in it, and forthwith applied it in his hospital practice, and with the results described in his great work on suggestive therapeutics, first published in 1886 and rewritten in 1889.

Bernheim himself had in 1889 hypnotized over ten thousand times, and to-day it is practiced by some of our best men in all parts of the globe. It has passed the stage of experiment and is no longer under the ban of charlatanism, but is considered as one of the most useful remedial agents at our command, and no physician can be considered truly progressive who refuses to inquire into the subject and admit the possibilities of its usefulness ; and he who does not use it is missing the means of curing maladies that nothing else will heal.

WHAT IS HYPNOTISM ?

Hypnotism is a misnomer, but it has become so firmly fixed that it is useless to attempt any change or substitution. Generally patients do not sleep in the sense of being unconscious, as in ordinary sleep. They are fully conscious, their faculties are keenly active, and their perceptions more acute than when in their usual state ; still the condition of the nervous system is radically different.

We have said hypnotism is a misnomer, yet no one has suggested a better name. We call it sleep to induce it, and we call it sleep to continue it, and we call on the patient to awake when we wish to terminate it ; hence it must be considered sleep, though in most cases not inappropriately conscious sleep. "The great essential feature of hypnotism is not sleep, but a heightened receptivity of suggestions with or without sleep ; in other words, any suggestions offered to a person during hypnosis has an exaggerated effect in his mind." But up to a certain point, that of lethargy, the deeper the sleep the greater the effect of the suggestion.

The mind seems to become nonresistant, and old thoughts are held in abeyance, and new thoughts are suggested and received to hold control, so that sometimes, during a single hypnosis, a condition directly opposite to that which previously existed may gain permanent control. Courage may succeed fear, rest replace fatigue, and sweet natural sleep come to the patient instead of insomnia.

HOW INDUCED?

It is impossible in one short paper to describe many methods of inducing hypnotism, and I must be content with a description of the one method which has proved so successful with the Nancy School, described substantially as follows by Bernheim :

"When the patient becomes quiet and assured, I hold my two fingers of my right hand before the patient's eyes and ask him to look at them, endeavoring at the same time to concentrate his attention upon the idea of sleep. I say, 'You think of nothing but sleep, your eyelids begin to feel heavy, your eyes are tired, they begin to wink and they are getting moist, you cannot see distinctly, they are closed, you are asleep.' Repeating the word 'sleep' in commanding tones will often turn the balance, and the eyes close and the patient sleeps. Sometimes I close the eyes immediately without use of fixation of the eyes, when by suggestion sleep follows.

"The patients usually find the object looked at grows indistinct. The eyelids blink and quiver, the eyes may water, the breathing frequently becomes quickened and may even be panting, though often it shows only the quiet, deep breathing of normal sleep, the pulse is often accelerated, then the eyelids gradually close and the patient is asleep. Sometimes the eyes shut suddenly, sometimes remain open and have to be closed forcibly."

DEHYPNOTIZATION.

For most patients the simple suggestion "Wake up" is quite sufficient to terminate the condition. Occasionally it may need to be repeated perhaps a little more emphatically. If the arousing is sluggish, fanning or blowing on the face is useful, with the command "Wake up" repeated. A slight shock, as a slap on the arm, will quicken the termination of the condition. No hypnotist of good technical knowledge has ever had any difficulty in arousing the patient from the hypnosis at will.

There are many ways of estimating the amount of hypnotism.

Bernheim divided it into nine distinct stages, Liebault into six, while the most simple division is *conscious* and *unconscious sleep.*

I have adopted the classification of Dr. Tuckey, of London. 1. Light sleep. 2. Profound sleep. 3. Somnambulism. 4. Lethargy.

The most of my patients have not gone beyond the second stage, a few reached the third, and one a very deep somnambulistic stage.

Among my dental cases there have none gone beyond the third stage. I earnestly recommend the careful study of Bernheim's great work. If any one desires to understand the science and the art, there will be found a complete and exhaustive treatment on the subject.

WHO CAN HYPNOTIZE?

Undoubtedly every one has the power in some degree. It seems to be one of the faculties of the human mind. Some have not enough of the faculty to amount to anything practically, while others have great ability in that way, while between those two extremes are all degrees of skill, according to nature and education. I consider it like the mechanical talent in man. Such are born mechanics, while others can never attain to any useful degree of skill.

It is as reasonable to expect success with hypnotism as for any good operator to succeed with any of the important operations in dentistry, and success with hypnotism will be at least as general as is success in the general practice of a dentist. There is nothing occult or strange about it, and nothing for any one to fear.

WHO CAN BE HYPNOTIZED?

The same answer as before serves. Some hypnotize very readily and deeply ; the other extreme are not effectual enough to be noticeable, while between these extremes are all grades of effect. Bernheim and other good authorities say that an ordinary good operator will hypnotize seventy per cent. of all his patients ; an operator who is especially experienced, careful and persistent, will attain eighty per cent., while exceptional natural ability and cultivation may obtain good results in as many as ninety per cent., but the last is exceptional. Dr. Kingsbury, of Dublin, considers six successes out of ten trials to be good results. My own cases have been exceedingly favorable. I have failed in not more than one case in fifteen, but mine have been selected cases, and I do not consider my experience extended enough to fix any definite per cent.

IS HYPNOTISM DANGEROUS?

The condition itself is not in the least dangerous. The patient is put into a quiet sleep, being light or deep as the susceptibility of the subject may determine. The patient is comfortable and resting, and if left alone will usually in fifteen or twenty minutes wake spontaneously as from a natural sleep. The hypnosis wears out. The patient may feel drowsy for some time longer, but soon returns to the former condition of wakefulness, but the quiet calming influence of the hypnosis is sure to remain.

M. Liebault says, "The accidents in hypnotism are due wholly to the ignorance or giddy tricks of the operator."

Moll says, "It is insufficient technical knowledge that is dangerous, not hypnotism. Hypnotism properly used is as harmless as electricity properly used"

CAN HARM BE DONE WITH HYPNOTISM?

I believe there can be. Anything that is powerful for good is also powerful for evil. Suggestion will cure headache; it will also cause headache. It will relieve contraction of the muscles, so it will cause it. Suggestion will stimulate good thoughts, and so it will give rise to bad thoughts."

But hypnotism can never do one tithe of the evil that alcohol and opium have done and are doing. They do their evil when used for good purposes by innocent and well-intentioned persons, and they usually have done their work before the victim is aware of it. Hypnotism can do no harm unless the operator is unpardonably ignorant or basely vile. Whatever ill or unpleasantness has seemed to attach to hypnotism has been when in the hands of amateurs or ignorant persons, who have at the time lost control of themselves and become frightened, and have frightened their subjects and lost control of them. No competent operator need have any fear for himself or his patient.

Patients so far as they are asleep are in an anæsthetized condition, and all the physical sensibilities are lessened, and facts show that the will becomes strengthened instead of weakened, and the patient is the better able to command himself.

Any thought averse to a patient's conviction is almost sure to rouse them, and it is very difficult to make even a somnambulistic subject do acts which violate his convictions even in a slight degree, and while a subject when hypnotized has been made to seize a paper cutter for a dagger and stab a door panel for a man, no violence has ever been recorded as a result of a post-hypnosic suggestion. In the few cases where personal submission seemed to have been the result of hypnotic influence, it to my mind is very evident there was not a state of complete unwillingness. Used by honest operators for therapeutic purposes, the influence of hypnotism is only for good.

The subjects previously mentioned, for whom the surgical operations were so successfully performed under hypnotic anæsthesia, were all subject to deep hypnosis, somnambulistic degree, and while exceptional cases of successful *Dental Anæsthesia* have been recorded, no uniform success has been attained or believed possible.

For a quarter of a century I have been hoping that the principles as now developed in hypnotism might be applied so as to bring relief to patients during dental operations, and it is with pleasure that I am able to-day to report a pronounced success in that direction.

A success I believe will continue, and the methods will be so formulated that the art will be within the reach of every intelligent operator on the human teeth.

During the past year, and especially during the past six months, I have been carefully studying the later works on hypnotism. I found that all the writers upon the subject, as far as I could learn, stated that pain would always wake a patient from the hypnotic sleep, unless such patient was in a somnambulistic condition. I felt it might be quite possible to derive distinct benefit in the lighter stages if they could be kept continuous. I soon *believed* it possible, and after a diligent study of Bernheim, I commenced to hypnotize, and my first effort proved a success, the patient reaching the second stage.

Early in March I felt equal to a trial for anæsthetizing dentine for excavating, and then made the discovery that continuous suggestion makes it possible to keep a patient hypnotized, and the dentine wholly or partially anæsthetized for a full preparation of a cavity during the light sleep of the first and second degree. I am not aware that this has ever been made successful before.

I maintain the hypnosis and the anæsthesia by a constant repetition of "Sleep, sleep, you are resting, you are not suffering, you are not dreading it, you do not care for it, sleep, sleep," and so on continuously so long as the condition is desired. It is practically a continual rehypnotizing to offset the continual waking caused by the cut of the instrument.

Sometimes the hypnosis will wear out in spite of continual suggestion, especially if the operator's attention is too wholly absorbed in the operation and his suggestions become weak. In such a case

I stop and hypnotize again. I have hypnotized as many as six times at one sitting.

If the sitting is long and the hypnosis deep, the patient is likely to get tired, and I have found it better to wake them up at intervals for rest or suggest a ready change of position, but the waking is much better. By making this conservative use of hypnotism, the patient in every instance will feel rested and stronger at the close of the sitting than before, and will improve in courage and quiet as the sittings succeed each other, and in many cases the need of hypnosis will cease to exist and the patient submit to the operation in the wakeful state without shrinking.

I had a case lately that illustrated it. A girl fourteen years old had dreaded dental operations so much that for two years she had not been able to have her teeth even cleansed. Hypnotism made cleansing, preparing and filling perfectly easy, and at the fourth sitting she had become so indifferent that she was quite willing to have a large cavity in a molar prepared and filled while fully awake. Others have experienced the same benefit.

These results have, it seems to me, proved that in my hands hypnotism as a sedative and as an obtundent is a marked success, and, I believe, equal and greater successes may be achieved by many other operators when they make intelligent effort to accomplish this desired end.

I give the following summary and analysis of twenty-one consecutive strictly dental cases, that you may judge from the record of the success of the anæsthesia. One patient failed to hypnotize. In every one of these cases it was proved that the dentine was very sensitive.

Hypnosis was applied thirty-eight times to twenty patients. Full anæsthesia of the dentine attained twenty-one times for eight patients, or for forty per cent. of the patients.

Anæsthesia not quite complete, but practically successful, twelve times for seven patients, or for thirty-five per cent. of the patients.

Anæsthesia complete with addition of alcohol vapor with Small's obtunder, six times for five patients, or for twenty-five per cent. of the patients

For use in surgery I record the following :

Applied successfully for removal of necrosed bone, once.

Applied successfully for extracting teeth, five times.

Applied successfully for operations on alveolar abscess, once.

Applied for removal of dread of taking gas to two patients—successful, one ; unsuccessful, one.

It is impossible to indicate in any table all the benefit that accrues to the patient from the hypnotism.

In every case there was almost complete and in most cases entire relaxation of nervous and muscular tension, so that the patient rested during the operation instead of being exhausted. Almost every patient left my operating chair, saying they felt better than when they sat down. I always suggest that the patient is resting, will wake up refreshed, will be undisturbed, and this result uniformly follows. If by any chance a different result obtains, I at once hypnotize again and correct the error This has occurred in a few instances, but thus far I have not failed to relieve the discomfort.

Another distinct gain has been described by several patients independently, viz : When any pain is felt, it is sensed only at the point of contact of the instrument, and not over the whole system as is commonly the case. If a tooth is extracted, there is no dread felt before the operation nor shock produced by it, only a little twinge felt the instant the tooth is being pulled.

A worthy Scotchman expressed himself to the point, after having a tooth extracted under hypnotism, " I rather think it helped me, it kind of reconciled me *down to* it."

The operation for necrosis mentioned was for a patient whose nervous system was much broken down. Any excitement from sorrow, fear or joy would invariably cause her several hours of nervous excitement and distress, entirely disabling her at the time. The hypnosis prevented any unfavorable results from the operation.

CASES.

I give the following cases in the order in which they followed, that you may see my progress in the art of hypnotism as well as of the anæsthetic effect.

Case 1. March 14th. My first attempt to hypnotize for dental purposes was for Miss L——, age twenty-two, to remove pulp after arsenic application. She hypnotized in about one minute to the first degree ; very light sleep. I suggested anæsthesia of tooth and pulp. It lessened the pain very much ; could not overcome all the sensitiveness of the pulp, nor have I been able to do so since in any case.

April 12th. Hypnotized and suggested for relief of toothache and restfulness, as she was very weary. Waked her in five minutes and found her toothache gone and herself feeling entirely rested and refreshed.

Case 2. March 16th. Mrs. L——, aged thirty-six. Hypnotized first degree, very light sleep. Suggested for anæsthesia of sensitive dentine. Pain during previous operations almost unbearable. Relieved sensibility very much. Made the cutting of two cavities on buccal surface of inferior bicuspids with both excavator and bur very easily borne. Suggestion did not last long, and hypnosis and suggestion had to be repeated several times.

Case 3. March 22d. Miss C., aged fifty. Necrosis from abscess on R. sup. lat. incis. Upper teeth all extracted five months before. The patient had nervous collapse seven years before and has since suffered repeated attacks. Any excitement or joy, sorrow or fear, or a pleasant hour with callers, would bring on a nervous spasm which would last one or two hours. Ether had an unpleasant effect upon her, and she preferred the operation without an anæsthetic on account of nervousness. Hypnotized first degree, bordering on second; applied cocaine to gum; incised and removed sections of gum; trephined the alveolar wall and removed spiculæ of dead bone. The operation lasted from seven to ten minutes. Patient lay quietly, scarcely flinching; dread all gone; upon awaking pronounced herself comfortable during the operation and suffering no shock, depression or weakness.

I did not think to suggest against subsequent pain, and some pain persisted in region of wound, also her temple and ear of same side. Hypnotized the second time and relieved the pain in wound and face. Waited twenty minutes, thinking the rest of the pain would subside; pain in ear persisted. Hypnotized the third time and suggestion relieved pain entirely, and the patient left my office feeling in very much better condition than before the operation.

March 28th. Had been getting along well, wound healing, nervous condition good, some neuralgia of head, face, arm and hand. I hypnotized and suggestion relieved the pain entirely.

March 29th, A. M. No return of pain in the arm or hand, a little pain in the head last evening and to-day Hypnosis and suggestion relieved it again completely. At 4:30 P. M., called again. Had been very busy during the day out in the wind, and tic of right temple had returned and involved the eyes. Hypnotized twice and completely relieved the trouble. The patient left town the next day, but subsequently I saw her and found relief from pain proved permanent, also the general good effects of the hypnotism continued.

Case 4. March 29th. Mrs. P——, age forty-five. R. sup. 1st molar abscessed. Crisis passed, tooth very sore, dead pulp remaining. Tooth needed drilling for removal of pulp. Patient dreaded the operation very much; did not sleep the night before on account of it; had a bad headache and neuralgic pains over entire system.

Hypnotized to second degree, dread entirely removed, scarcely any hurt during the operation ; was very comfortable and did not mind it at all ; systemic pains cured. Filled temporarily and hypnotized again, and suggested recovery without further trouble.

April 2d. Found tooth in good condition ; filled permanently ; hypnotized and suggested for continued health of tooth and system. The tooth has since remained well.

Case 5. March 31st. Prof. O——, age thirty-five. R. inf. 1st molar to be extracted, very badly abscessed. Hypnotized to first degree. Suggested that pain of extraction would be lessened and dread removed and shock prevented. The result fulfilled the prophecy.

April 14th. Had a R. sup. bicuspid root ; had wished it out for ten years ; could not get up his courage Hypnotized to note effect on his mind ; soon opened his mouth without dread ; extracted tooth ; felt no pain, only a little wrenching sensation, only local. He called it perfectly successful.

April 7th. Excavated and filled R. inf. lat. and cusp.; very tender indeed. Hypnotized ; relieved sensitiveness very much, and with alcohol vapor added made the anæsthesia complete. Patient said the pain was only local ; did not disturb the system ; found great relief.

Case 6. March 26th. Dr. P——, dentist, age thirty-four. Filled R. sup. cusp., lab. cavity ; exquisitely tender. He was unable to bear his finger nail on it. Hypnotized, second degree, light ; anæsthesia almost complete ; nervous and muscular relaxation entire ; used excavator and burs with engine all around the cavity ; and in twenty minutes from the time he sat in my chair the cavity was prepared. He found it a complete success.

April 1st. Filled R. sup. cusp. mes. cavity, not tender ; did not hypnotize at first. When tooth was nearly filled said he felt broken up ; was very much disturbed. Hypnotized him ; he became immediately quiet and entirely relieved of his discomfort.

Case 7. March 18th. Master G——, age ten. Very sensitive and uncomfortable. Hypnotized, first degree, very light. Quieted him a good deal and made it possible to do a little, but my success was indifferent, largely due, I think, to lack of interest on the patient's part, whose mother had little faith or interest in it. I hypnotized him for three sittings with about the same success.

Case 8. March 30th. Mrs. W——, age forty-three. Filled R. inf. first molar, very sensitive. Patient always very much disturbed by prospect and performance of dental operations. Hypnotized readily to first degree, but full influence maintained but a little time; a drowsy feeling persisted; all dread of operation gone; I used bur and chisel without resistence or suffering on her part. She thought it a complete success.

April 8th. Hypnotized with same success as before. Could not completely anæsthetize the dentine; added alcoholic vapor and completed the insensibility.

Case 9. April 1st. Mrs. C——, age twenty-nine. Condition, hypnotism and success same as in last case.

Case 10. Miss H——, age forty. Teeth always very sensitive. For twenty years had been troubled with insomnia; very nervous, excitable and apprehensive. Teeth in bad condition, owing to neglect on account of fear of pain.

April 5th. Hypnotized, third degree, somnambulistic, anæsthesia of dentine complete. Operated April 9th, 12th, 21st, and May 7th and 16th. Hypnotized each sitting.

May 28th. I gave a short hypnosis at the beginning of the sitting, and one at the end, operating in the meantime on a post hypnotic anæsthesia which was complete. This method gave relief and comfort; some of the former hypnosis had proved wearisome. The incidental benefits derived from the treatment were very marked. Up to the date of her first sitting she had uniformly taken some hypnotic to afford sleep. The night after her first hypnosis in the afternoon, she slept all night and far into the morning, and every night since, except three or four that she had some face ache. Her general condition is much improved; apprehensiveness much less, and nervousness much reduced, and has much better command of herself.

Case 11. April 11th, 18th, May 16th. Mr. M——, age thirty-two Teeth very sensitive. Hypnotized third degree; anæsthesia complete. Operated from an hour to an hour and a half at each sitting. At the close of the longer sittings he complained of feeling tired sitting so still; thought an hour long enough.

Case 12. Miss B——, age fourteen. A refined, healthy, vigorous girl, but so afraid of dentistry she had not been able to have teeth even cleansed for two years. Teeth extremely sensitive. Upon my promise that I would not touch her teeth, talked hypnotism to her, interested her, and made an appointment to try it and operate.

May 28th. I hypnotized her, first degree, suggestion removed all fear, and I cleansed her teeth without trouble and prepared and filled with cement two cavities in front teeth.

June 11th. Hypnotized again; prepared and filled with cement four cavities in front teeth. While excavating one of the cavities she flinched some. I feared discouraging her and waked her and asked if I should go ahead if it did hurt a little; said, "I don't care; go ahead!" Hypnotized again and finished according to instructions.

June 17th. Hypnotized twice; excavated three cavaties and filled with gold; used bur with engine without discomfort.

June 18th. Hypnotized and prepared one tooth, waked the patient and filled; then prepared and filled another molar while awake. The transformation of the patient was wonderful.

Case 13. Miss L——, age forty-two. Called on me in December, 1891, for new upper plate. Had been wearing artificial teeth on rubber for three years. Mouth had been constantly red with serious itching and burning. I made her a good fitting plate on rubber. Her mouth was no better. A few weeks later I made a gold plate, which she has worn since. It gave no relief from the burning and the redness persisted.

June 23, 1892, she called, seeking relief. I proposed hypnotism as an experiment. She was agreeable to it. Hypnotized her to nearly second degree. Suggested cessation of burning and change of color and return to health. Slept perhaps ten minutes. On waking the mouth had changed color perceptibly, burning gone.

June 24th. Had experienced discomfort only about one hour the evening of the 23d, and again this morning about the same length of time. Hypnotized again and suggested for health and comfort.

June 25th. Had experienced a little discomfort once for a short time since yesterday. Mouth still better. Hypnotized for complete recovery. I did not see the patient again until the 29th, four days intervening. Has had hardly any burning of the mouth since last visit until to-day, rather more. Mouth seems much improved in color and texture. Hypnotized for relief and cure.

June 30th. Mouth much better; no discomfort since yesterday. Hypnotized also on July 1st, 6th, 7th, 8th, 14th and 21st. July 22d mouth felt entirely well since June 30th; is now normal in color save two small patches, which are a little red, but not at all tender or uncomfortable. The patient has worn her plate all of the time.

These cases fairly represent the extremes and average of the results in my practice of the application of hypnotism to dentistry. I believe it is a power of great value to my patients and may be to the patients of other operators who may practice it. I invite the attention and thoughtful consideration of every one present to the subject.—FILLEBROWN (THOS), *Dental Review.*

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The twelfth annual meeting of the National Association of Dental Faculties was held at the Ocean Hotel, Asbury Park, N. J., commencing Saturday, August 2, 1895; the president, Dr. Frank Abbott, in the chair. The entire membership of the association was represented at this meeting as follows:

University of California, Dental Department—L. L. Dunbar.
University of Denver, Dental Department—R. B. Weiser.
Columbian University, Dental Department—J. Hall Lewis.
National University, Dental Department—J. Roland Walton.
Southern Medical College, Dental Department—Frank Holland.
American College of Dental Surgery—Louis Ottofy.
Chicago College of Dental Surgery—Truman W. Brophy.
Northwestern College of Dental Surgery—J. A. Whipple.
Northwestern University Dental School—George H. Cushing.
Indiana Dental College—George Edwin Hunt.
University of Iowa, Dental Department—A. O. Hunt.
Lonisville College of Dentistry—Francis Peabody.
Baltimore College of Dental Surgery—M. W. Foster.
University of Maryland, Dental Department—F. J. S. Gorgas.
Boston Dental College—J. A. Follett.
Harvard University, Dental Department—Thomas Fillebrown.
Dental College of the University of Michigan—J. Taft.
Detroit College of Medicine, Dental Department—G. S. Shattuck.
University of Minnesota, College of Dentistry—Thos. E. Weeks.
Kansas City Dental College—J. D. Patterson.
Western Dental College—D. J. McMillen.
Missouri Dental College—A. H. Fuller.
University of Buffalo, Dental Department—W. C. Barrett.
New York College of Dentistry—Frank Abbott.
Ohio College of Dental Surgery—H. A. Smith.
Western Reserve University, Dental Department—H. L. Ambler.
Pennsylvania College of Dental Surgery—C. N. Pierce.
Philadelphia Dental College—S. H. Guilford.
University of Pennsylvania, Dental Department—James Truman.
Meharry Medical School of Central Tennessee College, Dental Department—G. W. Hubbard.
University of Tennessee, Dental Department—J. P. Gray.
Vanderbilt University, Dental Department—Henry W. Morgan.
Royal College of Dental Surgeons of Ontario—J. B. Willmott.

The following colleges were admitted to membership:

University College of Medicine, Dental Department, Richmond, Va—L. M. Cowardin.

Atlanta Dental College—Wm. Crenshaw.

Birmingham Dental College—T. M. Allen.

Cincinnati College of Dental Surgery—G. S. Junkerman.

Cleveland University of Medicine and Surgery, Dental Department—S. B. Dewey.

The following, laid over under the rules from last year, were adopted as here given :

Resolved, That in view of the recommendation of the Executive Committee that this association now in session shall require that all colleges, members of this association, shall extend the term of the session of 1896-97, and of succeeding sessions, to not less than six months each :

Beginning with the session of 1895-96, no college shall be permitted to retain membership in this association if it is conducted or managed, in whole or in part, by any person or persons who do not practice dentistry in accordance with well recognized and generally accepted forms, generally known as dental ethics, or if they are owned in whole or in part by men or women who are engaged in disreputable dental practice, or if any college have upon its list of trustees, the faculty, demonstrators, or in any other capacity, any one who does not practice dentistry in accordance with the principles above mentioned. This shall refer to dentists only.

Beginning with the session of 1896-7 the examinations conducted by the colleges of this association shall be in the English language only.

The other resolutions which came over from last year for action were laid on the table.

A resolution was adopted requiring each college holding membership in the association to file with the secretary sixty days before the next meeting a detailed statement of its equipment and facilities for teaching ; all new applicants to file a similar statement with their applications. The secretary was instructed to have blanks forms printed for the purpose and forwarded to the various schools.

The report of the special committee on preliminary examinations was received and the committee discharged.

The following resolutions offered by Dr. Patterson were adopted :

Resolved, That students in attendance at colleges of this association are required to obey the laws regulating the practice of dentistry in the various states, and failing to do this, shall not again be received into any of the colleges of this association.

Resolved, That when a college of this association has increased the cost of tuition fees, no student shall be received at the former fee except those who have matriculated at such college prior to such action.

The Committee on Text-Books reported in favor of the adoption as text-books by the colleges of the association of two works, namely: "Dental Anatomy," by G. V. Black, M. D., D. D. S., and "Methods of Filling Teeth," by Rodrigues Ottolengui, M. D. S. The report was adopted.

The following lie over until next year:

Amendment to the rules offered by the Executive Committee:

That each college be allowed two delegates, and be limited to one vote for each school.

By Dr. Peabody:

That when a student who has matriculated within the time limit in any recognized college shall, from sickness, death or sickness in family, lack of funds, or other reasonable cause be compelled to retire from that college before the expiration of the term, he may be allowed to make up the deficit of time in the same or any other college (provided he enter at a date not later than that on which he retired), be examined by the last college entered, and if the examination be up to the requirements of that college, and otherwise satisfactory, may be given tickets for advanced standing or graduated, as the case may be.

By Dr. George Edwin Hunt:

Amend the last portion of Rule 3 to read as follows:

" Except on such conditions as would have been imposed in the original school, and these to be ascertained by conference with the school from whence he came."

By Dr. Gray:

Moved that when students from one college apply for advanced standing to any other college of this association it shall be the duty of the Dean or Secretary of the latter college to ascertain by correspondence with the college from which the student comes if there be any objection to his acception.

By Dr. Gray:

Resolved, That all colleges of this association shall charge not less than one hundred dollars tuition each session.

By Dr. A. O. Hunt:

Resolved, That a student who is suspended or expelled for cause from any college of this association shall not be received by any other college during the current session.

In case the action of the first college is expulsion the student shall not be given credit at any time for the course from which he was expelled.

Any college suspending any student shall at once notify all other members of this association of its action.

The following resolution offered by Dr. Ottofy was adopted:

Resolved, That the endorsement of applications for membership, made during the coming year shall be based upon definite knowledge obtained by a careful examination of the methods of teaching, the equipment, and the efficiency of the Faculty.

The report of the committee on revision of the constitution, laws, and codified rules was considered section by section, and laid over for final action next year; and the committee, consisting of Drs. Louis Ottofy, A. O. Hunt, and J. D. Patterson, was continued.

The following were elected officers for the ensuing year: S. H. Guildford, president; Geo. H. Cushing, vice-president; Louis Ottofy, secretary; Henry W. Morgan, treasurer; J. Taft, Thomas Fillebrown, B. Holly Smith, executive committee; H. A. Smith, A. O. Hunt, and T. W. Brophy, ad interim committee.

The newly elected officers were installed and the president announced the standing committees as follows: J. A. Follett, L. L. Dunbar, Geo. Edwin Hunt, C. N. Pierce, and T. W. Brophy, committee on schools; J. D. Patterson, A. O. Hunt, J. B. Willmott, T. E. Weeks, and J. P. Gray, committee on text-books.

Adjourned to meet at the call of the Executive Committee.

A CASE OF TETANUS AFFECTING THE MUSCLES OF JAWS ONLY.

Tetanus is defined as a disease consisting in an excited state of the spinal cord and the medulla oblongata, in fact of the whole true spinal system, giving rise to painful and continued spasms of the voluntary muscles. The question is, whether the disease does ever confine itself to the muscles of jaws only, leaving all other voluntary muscles in their normal states. Authorities are quite unanimous on the point that tetanus commences as lockjaw, but gradually affects all the other voluntary muscles. A case came under my treatment in which the patient had lockjaw as the result of an arrow wound received twenty-one days previously. There were no other symptoms of tetanus, excepting trismus, or spasms of the masseters. The patient ultimately succumbed to the attack. The case may be detailed as below:

Poonia, male, aged thirty-five, was admitted to the Ranchi (Bengal, India), Imperial Hospital on the 3d of April, 1894, suffering from an arrow wound of the right thigh.

The bow and arrow were set in a jungle to kill tigers; the patient, while back from the jungle, passed by the way where the arrow had been fixed and was struck by it. It may be interesting to the reader of this paper to know how bows are set in Indian jungles for the purpose of killing tigers and other ferocious animals. The arrow-heads are smeared with vegetable poisons. The bow and arrow are set with such precision that the arrow, when shot, will not strike any other animal excepting a tiger. The *shikarees* (or men engaged in this business) take care to find out the paths in the jungle frequented by the tigers and the approximate height of these animals. Having satisfied themselves as to these points, they betake to setting the bow with the arrow fixed. The arrow-head is made to point towards the path trodden by the tiger, and a fine string is attached to the bow with such a mechanism that the least touch on the string will let free the arrow from the bow. The string, however, is fixed at such a height from the ground that the arrow when shot will strike the chest of the tiger. If cows or buffalos happen to stray along the path and perchance come against the string, the arrow passes underneath their abdomen, whereas goats or sheep are not high enough to touch the string. The villagers, of course, are kept fully acquainted with these, and they avoid passing that way. If by chance any go that way the arrow strikes him in the thigh. Death follows from injury to the vital parts, as well as from effects of poison on the arrow-head.

The patient was not aware of the setting of the arrow, and while passing listlessly that way he came upon a string, and was struck by an arrow. There was profuse hemorrhage from the wound. On hearing of this the *shikaree* who had set the arrow soon came to the spot, liberated the arrow from the thigh, and applied some native drug to counteract the poison on the arrow-head. On admission the wound was full of purulent, offensive matter. It was syringed out with sublimate lotion and dressed. In one week the wound looked healthy and was fairly granulating.

But on the 11th—*i. e.*, the twenty-first day after receipt of the wound—the patient had symptoms of lockjaw (trismus.) He could not open his mouth to the fullest extent. He was at once put under the influence of bromide of potassium and chloral hydrate. He used to have sound sleep, but there was no diminution of the spasms of the masseters There were no other symptoms of tetanus. The patient could with slight difficulty swallow liquid or semi-solid food, as rice and milk. There was slight stiffness of the sterno-mastoids. The spasms of the masseters gradually became less troublesome, so that the patient could open his jaws to a greater extent.

On the 21st of April the spasm was so troublesome that the patient could not open his jaws to the extent previously done.

On the 24th the patient was laid up with an attack of dysenteric diarrhea, which prostrated him to a dangerous extent. Under appropriate treatment it stopped on the 30th, when the patient passed formed stools.

By the 9th of May the patient was strong enough to walk about with the help of a stick and could open his jaws, but there was still present slight contraction of the sterno-mastoid. The wound had by this time completely healed up.

On the 14th the patient had an attack of acute diarrhea. The stools were watery. The diarrhea continued on increasing. The right foot became edematous, and in spite of best treatment and careful nursing the patient's condition became worse day by day.

20th.—The patient was prostrated to an alarming extent. The eyes were sunken, the pulse small and weak. Stimulants had to be pushed on, but it proved of no avail, and the patient died on the 21st.

Is it not a case of tetanus? I should be inclined to answer the question in the affirmative. But we are then to understand that in tetanus the spasms may affect the muscles of the jaws only, and not necessarily all the voluntary muscles, as averred by medical authorities. Spasms of the muscles of the jaws cannot be fatal unless it interferes with free deglutition. In the present case the patient could all along swallow liquid food. The fatal diarrhea was no doubt the result of the action of some poison—maybe the poison on the arrowhead. The question is an intricate one. I leave it to the readers for their opinion.—MITRA (N. C.), *Atlanta Medical and Surgical Journal.*

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The thirteenth annual session of the National Association of Dental Examiners was held at Asbury Park, N. J., commencing Monday, August 5, 1895; the president, Dr. L. Ashley Faught, of Philadelphia, in the chair.

The following state boards were represented at the sessions:

Alabama—T. P. Whitby.
Delaware—C. R. Jefferis, D. M. Hitch.
Georgia—J. H. Coyle.
Iowa—J. T. Abbott.
Kentucky—H. B. Tileston.
Kansas—J. O. Houx.
Colorado—R. B. Weiser.
New Jersey—F. C. Barlow, Chas. A. Meeker, Geo. E. Adams, E. M. Beesley.

Pennsylvania—Louis Jack, W. E. Magill, L. Ashley Faught, Jesse C. Green.

Tennessee—F. A. Shotwell.

Virginia—J. Hall Moore.

District of Columbia—H. B. Noble, William Donnally.

The following boards were elected to membership :

Connecticut—Geo. L. Parmele.

New York—William Carr.

New Hampshire—Edward B. Davis.

A resolution, offered by Dr. Barlow, requiring credentials to the association to bear the official seal of the state board making the application, was adopted.

A resolution offered by Dr. Donnally last year, and laid over, permitting persons who have been delegates to the association to be associate members without the right to vote or hold office, was taken up and adopted.

Dr. Jack offered the following, which was adopted :

Resolved, That this body would express to the Association of Faculties the importance of an examination of the equipment, methods, and facilities of instruction of all the dental colleges of this country ; it being understood that such examination is to be purely in the interest of higher educational standards and toward an approach to ultimate uniformity in the curriculum and methods of the schools, and more particularly to enable safe action to be made with respect to new schools.

Later a communication was received from the secretary of the National Association of Dental Faculties to the effect that the association had ordered the secretary to secure information from the various colleges regarding their equipment and general facilities for teaching ; that this information would be systematized so as to be available at the next annual meeting of this body.

The following " plan of requirements for the recognition of dental schools," offered by Dr. Jack, was adopted, with a proviso that it shall apply only to colleges making application after the close of this session :

That each dental school which may in future come before this board for recognition, must have a teaching faculty composed as follows, to wit : at least three professors of dental subjects, namely, for operative dentistry, for dental prosthetics, for dental pathology and therapeutics. For the medical subjects there must be at least five professors, namely, for anatomy, for physiology, for chemistry, for pathology, and for materia medica.

Its students must also be taught the subjects of chemistry and bacteriology in laboratories adapted to the purpose and under suitable instructors.

That such special school must possess, in addition to suitable lecture-rooms, a well-appointed dental infirmary and a general prosthetic laboratory ; also each school must be provided with a room or rooms suitable for manual training in operative dentistry, and must furnish in this way systematic instruction to its students.

All of these provisions are to be determined by careful inspection on the part of the Board of Examiners of the state within which is located the school, or other authorized body duly indorsed by this association. And upon the result of this examination may depend the question of reputability.

The following colleges were added to the list of recognized schools : Dental Department of the University of Denver, Denver, Col.; Department of Dentistry of Detroit College of Medicine, Detroit, Mich.; Dental Department of Western Reserve University, Cleveland, O.

Applications from the following were laid over one year : University of Buffalo, Dental Department ; Atlanta Dental College ; University College of Medicine, Dental Department, Richmond, Va ; Birmingham Dental College ; Cincinnati College of Dental Surgery.

The Committee on Colleges in its report, which was presented by its chairman, Dr. Jack. expressed the view that more should be required to establish the right of dental schools to recognition by this body than good organization and the fulfillment of the rules of the Association of Faculties. Evidence should be furnished that the teachers are of high standing ; that they require of their matriculates the stipulated preliminary training, and that they are carefully qualifying their students in every necessary direction. To ascertain these facts is a matter of difficulty. It is necessary, too, in addition to an ascertainment of the character of the faculties of any school, to discover the degree of confidence which has been developed in the minds of the local members of the profession.

The number of students in actual attendance in all the schools of the country for the session 1894–95, excluding those attending special courses, was 4,979, as against 3,997 at the previous session ; graduates 1,208, as against 911.

The committee also expressed the conviction that it is becoming evident that the dental schools are increasing in number beyond the needs of the public, owing to the tendency of medical schools to inaugurate dental departments. The installation of dental departments in connection with medical schools is necessarily often incomplete, and therefore the committee believes that restrictions should be placed upon the rapid increase of inefficient dental colleges. As the practice of dentistry is largely based upon knowledge of chemistry and bacteriology, and as manual training has become an integral part of the curriculum of some of the better schools, we recommend that the association do not in future recognize any school unless satisfactory evidence is furnished that the students of such schools applying for recognition are being taught in modern chemical and bacteriological laboratories, and are also furnished with every convenience for manual training in prosthetic and operative dentistry, and that this latter mode of practical instruction is systematically carried on in at least the first year's course.

The committee also called attention to the importance of a higher standard of preliminary education, and to the impropriety of schools advertising as instructors practitioners who occasionally clinic before the students, but are not a part of the staff of the institution.

The report was adopted.

The following resolution, offered by Dr. Magill, was unanimously adopted :

Resolved, That we will not in future consider favorably an application for recognition from any college which has as a member of its faculty one who also holds membership in the State Examining Board.

Dr. Donnally moved that final action shall not be taken on the application of any college until such application has been in the hands of the chairman of the Committee on Colleges for at least ten months. So ordered.

The following were elected officers for the ensuing year : J. T. Abbott, Manchester, Iowa, president ; H. B. Noble, Washington, D. C., vice-president ; Charles A. Meeker, Newark, N. J., secretary and treasurer.

Adjourned.

EMASCULATION AND OVARIOTOMY AS A PENALTY FOR CRIME AND THE REFORMATION OF CRIMINALS.

Dr. Robert Boal concludes as follows :

1. That the surgical unsexing of all criminals convicted of offenses that indicate constitutional depravities that are transmissible by heredity is both expedient and practicable.
2. This penalty should be applicable to both sexes.
3. That most of the offenses against society by vicious and defective classes originate in sexual disturbance either in deprivation or excess.
4. It limits the reproduction and transmission by heredity of the defective and criminal classes of society.
5. It inflicts a penalty that is terrifying and abhorrent without destroying life.

6. It is applicable to other offenses against person or property, originating from other than sexual causes.

7. While effective, the punishment is neither cruel nor vindictive.

8. It is more effectual in changing and improving the nature of the criminal than moral instruction, confinement in prison or houses of correction.—*General Practitioner.*

THE TECHNIC SYSTEM.

Independently of the distinct advance along legislative lines, has occurred a rapid and substantial growth in dental educational methods, comprehended in what is known as the technic system. Three years ago a few enthusiastic teachers who had, from investigation and practical experience in the workings of the technic system, realized its great value, met together and organized the National School of Dental Technics, the youngest and perhaps the most interesting offshoot of the educational phase of our evolution. Its purpose is the increase and spread of the sphere of usefulness of the system, and the securing of an opportunity for the interchange of ideas and experiences in its development and practical application. The National School is made up of delegates from those colleges in which the system is installed. At its incipiency eleven colleges were represented ; at the time of the late meeting its membership was increased to twenty-nine. The proceedings consisted of an exhibit of the work done in the application of the technic method to various departments of dental education, and the discussion of ways and means for its further development and betterment in the practical work of teaching. So rapid has been the growth of this system and so general has been its acceptance that the results were to many a revelation. It is quite evident that an entire revolution in our classical methods of dental education is near at hand.

That the technic system is based upon correct psychological principles cannot be questioned ; and no one can doubt that where the system is intelligently applied, its value in improving the educational equipment of the student is far beyond anything heretofore accomplished in that direction. A correct appreciation of the principles upon which it is based is, however, essential to its successful application. A source of danger affecting its efficiency may easily arise from a misconception of just what is intended to be achieved by the technic system,—that is to say, in regarding it merely as a system of manual training. It is a manual training method, but its distinctive trait is not a training of the hand, but a training of the brain through the perceptive faculties, the most prominent of which in this connection being that of touch, has led to its being designated as a manual training method. Now, according to the way in which this system is regarded by the teacher, is it likely to result in success or failure? If it is regarded simply as a manual training means, there is grave danger that a multiplicity of details and methods will be introduced for hand-training, having but little value in systematically directing the brain in the desired path, leading to confusion and waste of force, and thus failing to produce an adequate educational result. If, on the other hand, it is thoroughly recognized that the technic system is a valuable method for intellectual cultivation and training, it will furnish to the work of the Faculties Association a great and valuable pedagogical motive, second only, if not equal in importance, to its legislative function. That the National School of Dental Technics should ultimately become an integral part of the Faculties Association, or at least closely correlated with it, would seem desirable. While the function of the Faculties Association is educational, it concerns itself principally with the judical and legislative factors of the educational problem. If these two could be harmoniously correlated with the pedagogical factor alluded to, much good would naturally flow out of their co-operative efforts toward their common end and purpose,—the betterment of our educational standards.—*Dental Cosmos.*

TEN MEDICO-LEGAL POINTS IN REGARD TO POISONING.

1. Poisoning like other violent deaths may be homicidal, suicidal or accidental.

2. Poisons may be administered by the lungs, by the mouth, by the skin, by the rectum, under the skin, and by the bladder.

3. The action of a poison on the system is modified by dose, age, sex, occupation, climate, condition of disease, habit, and personal idiosyncracy.

4. Poisons may be felonously administered with intent to kill, intent to do grievous bodily harm, intent to commit some other indictable offense, and intent to agrieve and annoy.

5. Murderers usually select a poison without peculiar taste, smell, or color; that acts in small quantity; that does not produce its effect too suddenly after taking, and the post-mortem appearances of which resemble those of natural diseases.

6. Suicides select a poison that has the reputation of producing death, surely, quickly, and without pain.

7. Poisons as regards their effect and mode of action, may be

divided into those which spend their harmful force locally, and those which act through the medium of the nervous system.

8. All specimens supposed to contain poisons, obtained for the purpose of medico-legal analysis, should be kept in chemically clean jars, sealed with your own seal, and all entrances to the room in which they are kept should be sealed in like manner, so that no tampering by outside parties may be possible.

9. The chemical proof of the presence in the system of poisons, is entirely worthless, if embalming by injection has been previously done.

10. The diagnosis between some vegetable poisons in the contents of the stomach, and some of the products of putrefaction is impossible, chemically, with sufficient accuracy for legal purposes.—*General Practitioner.*

WHICH METHOD OF ROOT-CANAL FILLING WILL COMPLETELY OBLITERATE SPACE?

In the half of the evening allotted to me there is not time for a full consideration of the different methods employed in filling the root-canals of the teeth, and I may as well proceed at once to describe the one that I believe to be the best, and the one I have adopted after many years' close study of the whole subject.

Before I can do that intelligently, however, it will be necessary to consider at some length the matter of the approach to the roots that are to be cleaned and filled. The methods I employ for the most part require openings to be made through the teeth directly over the roots in a line with their long axis, so that their canals can be entered with nearly straight instruments. The methods of cleaning and filling the canals, which will be described later, will show this to be an almost indispensable condition. If the cavaties of decay do not allow this fairly direct approach, then tap-holes are to be drilled through the tooth, so that the roots can be entered in a nearly straight line. Leaving all cavities out of the question, and first considering sound teeth that are dead and have to be opened, we have then only to regard the fissures in the crowns, and to remember the anatomy of the roots, in order to know exactly where to drill No mention need be made of the superior and inferior incisors, further than to say that, as a matter of course, they are to be drilled on their lingual sides, and at such angles as will give access to their canals in nearly a straight line. The first inferior bicuspids must be drilled through the small anterior crown fissure; the second bicuspid through the anterior division of its single irregular fissure. The first lower molar, not through the deep fissure near the middle of the crown, but just anteriorly to it, so that the tap-hole will come nearly over the anterior root. The tap-hole should then be reamed posteriorly to give access to the posterior root. The backward slant of this root is such that nothing more is needed to give direct access to its canal.

Then, substituting a right-angle hand-piece, the same tap-hole should be reamed towards the buccal and the lingual sides of the tooth, and this will open up the two canals in the anterior root, so that nearly straight instruments can be passed to their extremities. The inferior second molar should be entered just anteriorly of the deep middle fissure, so that the anterior root can be entered in nearly a straight line. A little reaming posteriorly will give access to the posterior root, as in the case of the first molar. The inferior wisdom tooth should be entered, also, just a trifle in front of the center of the crown. The superior first bicuspid should be entered through the anterior depression of the fissure. This will give direct access to the two roots, if they exist. The second superior bicuspid, of course, through the fissure in the center of the crown. The superior first molar should be entered through the anterior deep fissure, and the tap-hole reamed towards the palatine and buccal roots. The superior second molar should be entered through the anterior fissure in the same way. The superior wisdom-tooth should be entered from the anterior edge of its irregular fissure. The sizes of these tap-holes must vary with the different teeth. They must be as small as possible, in order not to weaken the teeth ; but, on the other hand, they must be large enough to allow the entrance of light, and to give a chance for accurate work.

One naturally shrinks from drilling a hole in a sound tooth, but it is a necessary means to an end, and the patient had better have a weakened tooth with healthful roots than diseased roots, and a sound, strong tooth.

Thus far I have assumed the absence of cavities. If they occur in the center of the crowns, or on the anterior approximal surfaces of the molars and bicuspids of either jaw, tap-holes may not be necessary ; but if they occur on the posterior approximal surfaces of these teeth, and are not very large, tap-holes are indispensable. If they are not considered so for the use of the instruments generally employed for cleaning and filling the roots, they certainly are for the use of the instruments I shall describe. A large cavity in the posterior surface of a lower molar may give direct access to the posterior root. In that event the tap-hole can be drilled more directly over the anterior roots. In such cases I have many times drilled two small holes over the front root, one over each canal, throwing the light by reflection through the cavity of decay. In the same manner a large cavity on the posterior surface of the superior molar may give direct access to the palatine root, and two tap-holes, one over each of the buccal roots, will give direct access to their canals. Often the tooth substance between these two tap-holes can be cut away with a fissure-bur, leaving a slot through which work is facilitated, and without much weakening of the tooth. This slot will be nearly half-way between the bottom of the deep fissure and the tips of the buccal cusps. In this case, also, light by reflection can be afforded through the cavity of decay, and the tap-holes can be very small and the slot very narrow.

If these large cavities on the posterior surfaces of molars do not quite give direct access to the posterior or palatine roots, a fissure-bur readily cuts a groove in the grinding-surface edge of the cavity, and a tapered root-canal reamer, revolved on the posterior side of the opening into the canals, opens up the root so that a straight broach wrapped with cotton can be rotated in it, and this rotation may be essential to its thorough cleansing. The reamers used for this purpose are those I presented before this Society several years ago. They are never used, except for opening the orifices of root-canals. They have a very gradual taper, so that no shoulder or irregularity of surface is left, as often occurs with the reamers generally in use. Cutting, as they do, on their sides, they are very dangerous instruments to use deep in the roots, and their use is, therefore, restricted to opening the orifices of the canals. And here let me say that I never use any of the means employed for enlarging the canals, except at their orifices, as described.

The roots of teeth are often very crooked, and some are very flat and thin, and an immense number of valuable teeth have been lost by heroic drilling through their sides. An untouched canal is always smooth, and, though curved, its extremities can almost invariably be reached with the proper instruments.

I will not say that I never use a fine barbed broach for the removal of freshly-devitalized pulps, but I will say that I seldom use them, even for that purpose, and I do not use them in any canal in which a pulp has been for some time dead. In their place I use the well-known Swiss broaches, made for watch-makers, and which can be found at any of the places where jewellers get their supplies. They are four-sided, and highly polished and spring-tempered. I place a dozen or two of them in a glass tube, and draw the temper to a deep blue, over an alcohol lamp or a Bunsen burner. The glass protects them from currents of cold air, allows them to cool slowly, and enables one to see the color of the steel. On these tempered instruments shreds of cotton or raw silk can be lightly or loosely rolled, so that it can be withdrawn from the root of a tooth, or left in it, as desired. If tightly rolled, it can be entangled in a devitalized pulp in such a way that the whole pulp can be removed with considerable precision. The silk or cotton, though very tightly rolled, is yet easily removed from the instrument by laying it between the folds of a napkin and pulling it off with the thumb and finger. If it has been used in a root long dead, the fingers can be protected from the bad odor of the cotton or silk by the use of a piece of rubber dam placed outside of the napkin.

There are many advantages in the use of this instrument in all the root-canal operations. In the first place, the fact that the broach is square makes it possible to roll the silk or cotton upon it with any degree of looseness or firmness in an instant of time. This, of course, cannot be done with a round, smooth broach. Having no barbs, the cotton or silk is equally quickly removed between the thumb and finger. Also, having no barbs, there are no weak places along its whole length, and it does not readily break. Every barbed instrument is weakened at the base of every barb ; even a cross-scratch on any round instrument determines the place where it will break, if it break at all. If the barbed instruments do not break off entirely, the barbs almost invariably do, and in the canals, from which they cannot be removed. Besides, the barbs increase the diameter of the instrument, and it is no wonder that it is generally accepted that the fine canals of the anterior root of the first lower molar and the buccal roots of the superior molars cannot be entered to their extremities.

Swiss broaches can be procured that are almost hair-like is size, and their diameter is but slightly increased by a few fibres of silk or cotton, and they can be carried almost invariably to the end of every root-canal.

Charged with carbolic acid and used with patience, the living fibrils of pulp in a minute canal can be cauterized and destroyed, and in a blackened and disintegrated form can be removed little by little. It takes time, but finally the end of the root will be reached, and after the use of a great many rolls of silk it will finally come out of the canal, white and dry and clean. Or, if the root has been long dead, the same persistent effort will bring it out clean and comparatively odorless. By rotation of the instrument the contents of the canal become entangled in the silk and are removed. This rotation of the instrument is very essential, and now it can be seen why it is so necessary to open the teeth in such a way that a straight instrument can be used. These slender instruments can be employed in a wonderful way if they are kept straight, but they become unmanageable if they are bent.

For places where a stiff instrument is needed, I have points made from untempered piano-wire, but filed square, so that the cotton can be rolled on them in the same ready way. They are tapered like a trout-rod. They are stiff near the shank, and are therefore very manageable, and can be bent to enter a canal where direct access to it cannot be easily had.

The method by which these points are fastened to the handles originated with Dr. Darby. They are soldered to a little shank, and that is threaded and screwed into the socket-handle. In this way they are held firmly. This is a little thing, but it has been of great value to me.

For holding the Swiss broaches I have little handles turned from rosewood. They are tapered to a small diameter at the end, held by the thumb and finger. This is to facilitate rolling the cotton on the instrument. Of course, the smaller the diameter the faster it rolls. In the end that holds the instrument a hole is drilled, and the instrument, with a few fibres of cotton rolled on it, is easily fitted, and easily removed if it becomes broken. Into the end of the large handles that hold the stiff instruments a little wire is driven, which, held between the thumb and finger, enables one to rotate the instrument rapidly in rolling the silk or cotton on the point.

I have taken all this time to describe these instruments minutely because their use leads up to, and gives the key to the method I employ in filling the roots.

There may be nothing new to say on the subject of filling root-canals of good size. The posterior roots of lower molars, the palatine roots of superior molars, and the roots of the bicuspids and of the incisors, are probably filled by most operators either with chloro-percha, followed with the gutta-percha points, or with oxychloride, followed by the same points, in a manner that may be proof against the most searching criticism. These gutta-percha points originated in my office, and I have watched the headway they have made, naturally, perhaps, with considerable interest. They were suggested to me years ago by the use of the delicate paper points for drying the canals, described before this Society in a paper called "Offerings." by J. F. P. Hodson.

I think it will be generally admitted that the anterior roots of lower molars, and the buccal roots of superior molars, and very minute canals in general, have not only not been accurately filled, but have not always even had their pulps completely destroyed and removed, and in old, dead teeth they have not always been cleaned. I will not go so far as to say that with the delicate Swiss broaches, in the way described, it is possible to get to the end of all these inaccessible canals, but I will state that it is a practical thing to do so in almost every case. It is not only possible to get the canals clean, but it is also possible to fill them with a considerable degree of accuracy. If the hair-like broach, which is used for cleaning one of these fine canals, were wrapped with silk or cotton, and that charged with oxychloride or with chloro-percha, and then carried down to the closed end of the root (and these fine canals are always practically closed), and it could be left there, no one could deny that the canal must be filled with all the accuracy that could be expected in any root-filling. But, of course, the steel wire would not be permissible. When it is removed a space is left. Some of the chloro-percha or oxychloride may remain. We may repeat this process, and still there will be the same result.

Let us not deceive ourselves by believing that into such a minute hole, closed at one end and full of air, we can pump either of the materials named in such a way as to obliterate all space. With a minute opening at the end of the root for the escape of the air, it might be done, but in the roots of teeth in the mouth it is an impossibility. If we wrap the fibres of silk or cotton loosely so that they slip off the instrument and remain, still there is the space left by the instrument when it is removed. The only way is to leave the instrument itself. This result I accomplish by substituting gold or platinum wire, in the following manner :

The end of a piece of gold wire, smaller than the diameter of the canal to be filled, is bent over on itself with the pliers, and crimped to a uniform size in a fine groove in the beaks of the pliers. The length of the portion bent over is not more than the diameter of an ordinary pin. This is done in order to get a better hold of the wire if it ever needs to be removed from the root. In attempting to pull it out, if it does not come, but straightens out, there is then wire enough to get hold of with suitably made pliers. This doubled end of the wire is then fastened in a delicate pin-vice made for the purpose.

The depth of the canal having been measured by slipping on the Swiss broach one of the little rubber disks cut from the rubber dam by the Ainsworth punch, the wire is cut to the right length, and then, being firmly held by the pin-vice, is filed square to a tapering point by a very fine file. On this wire a half-dozen or a dozen fibres of silk or cotton are rolled exactly as is done on the Swiss broach. This is then transferred from the pin-vice to a plugger-point, into the end of which a hole is drilled, large enough to receive the doubled end of the gold wire. The fit is close enough to hold, and yet so loose that, when the gold wire has been put to its place in the root, the plugger slips off and leaves it in place.

This gold wire, while held in the plugger-point, is dipped in chloro percha or oxychloride of zinc and put at once to its place in the root, the canal having just been swabbed with a cotton-wrapped Swiss broach, wet with a very thin solution of the chloro-percha or the oxychloride, as the case may be. When this gold wire is carried to its place it is certain that the root is filled to its extremity as perfectly as it may ever be. The plugger is of soft steel, so that, in a moment, it can be bent at any angle.

In this manner it is possible to fill these canals through a comparatively small tap-hole. This operation requires nice manipulation (there is none in dentistry that requires nicer) ; but it can be done, and exactly as described here.

If it is not admitted that these minute roots can be accurately filled in this way, I think it must be believed that they can be cleaned and sterilized in the manner described, and that is a clean gain, and, by some, may be considered sufficient ; for many believe that if the apical end is closed the roots may safely go unfilled. I do not admit this, but I do believe the thorough cleaning and sterilization of any closed root is more important than its perfect filling.

The objective point in all root-filling is the apical end of the canal. I believe this can be reached with unerring certainty by no other means than by a wire in some form. When this is well filled, the rest of the canal may be poorly filled, and yet the tooth will do well. In general practice I think this end is poorly filled, and the accessible part of the canal is well filled. I am ready to make the assertion that the roots of any tooth freshly devitalized and filled in this way will never give trouble. It is an impossibility if it is accomplished with thorough sterilization. Of course, I would not make any such claim for any tooth that had been dead for some time before the treatment was applied. Dead roots, in which and about which septic influences have been at work, must always remain somewhat uncertain.

You will notice that I have given attention thus far only to very minute canals. There is not time now to say more than a word about the filling of canals of larger size. In fact, there is not very much to say if I had more time. In the early days it was my habit, as it was the habit of most practitioners, I think, to use chloride of zinc, carried to the apex on a shred of cotton, the cotton being left in the root. After hitting upon the idea of gutta-percha points plunged cold into a canal wet with chlora-percha, I used them generally for many years.

For large canals, and those open at the apical ends, I used pointed gold wire dipped in chloro-percha, or barbed and warmed, and wrapped with red gutta-percha, not exactly as described long since by Dr. Morrison, but nearly so.

A few years ago Dr. Howe called the attention of this Society to the fact that gutta-percha is a neutral substance, and, besides having no antiseptic action, is capable of absorption, as shown by the disagreeable odor arising from it when removed from a root-canal and warmed over the flame of a lamp, as well as from its tendency to expand. In fact, this warming is not necessary to demonstrate the fact stated. I recognized the truth of this, and from that time I preceded the gutta-percha points in closed roots with chloride of zinc, plunging the cold, stiff points through this creamy substance, and then filling the root-chamber with it. When these points are surrounded by an envelope of oxychloride of zinc, I think the root remains sterilized, and that this combination makes almost an ideal root-filling. It has the advantage of comparatively easy removal, and that, I think, is an important consideration.

If the canals are only of medium size, and there is danger that the points will be doubled up and not carried through the oxychloride to the apex, then I use gold wire in the manner already described, but wire, of course, of larger size.

If the canals are open at the apex, I use gold wire wrapped with a few shreds of silk and dipped in chloro-percha, and pushed to the apex by exact measurement. If the canals and the opening at the apex are very large, then I use gold wire barbed and wrapped with red gutta-percha, putting it in and taking it out several times to get a sort of impression of the canal, and thus being able to judge a little better of the amount to use, and putting it in finally by exact measurement.

All these gold wires have provision made for their removal, the large one having a notch filed near the end in which an instrument can be engaged, and the little ones being bent double near the end.

Where chloro-percha is used they are all easily removed. They can also be removed where oxychloride is used if they fit the root well, so that only a thin covering of oxychloride exists. But they cannot easily be removed if they are much smaller than the diameter of the canal, so that they are embedded in a thick mass of the oxyphosphate.

Although I make this provision for the removal of these fillings, for it is easily done, yet I never expect to have to do it in any freshly devitalized tooth where I have had the full control of the operation of removing the pulp and filling the root. But with teeth long dead I have no such feeling of security. Such teeth are favorable ones for the use of wax or paraffine, and particularly for a canal paste perfected by Dr. Lord, and used by him for many years. It was used by Dr. Bronson, and since by Dr. Van Woert, and was spoken of very highly by him before this Society. This latter should commend itself to our attention, as it has the great advantage of being easily removed. It is composed of iodol, zinc oxide, carbolated vaseline, and a little oil of cinnamon.

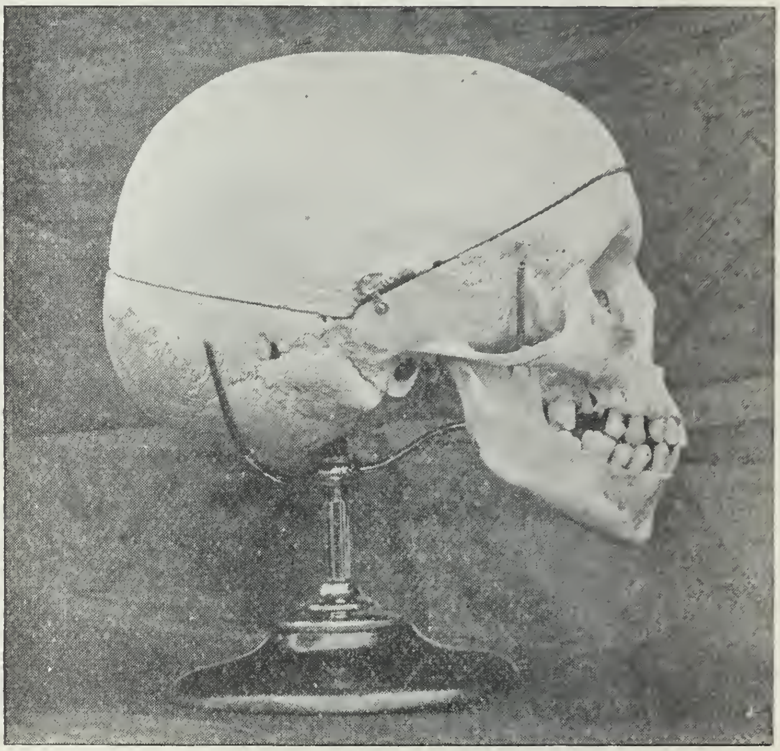
Gold wires are particularly suitable for the successful use of either of these materials.

I cannot close without a further word in reference to oxychloride of zinc. It has been long before the profession, and has probably been more used, skillfully and unskillfully, for root-fillings than any substance known, and it continues to occupy a prominent place to-day as in the past. My own belief is that the good results arising from its use are due mainly to its antiseptic properties. But I consider it a dangerous material to use in roots, the apical ends of which are open. It may be said that it is not altogether easy of removal, and that should lead us to search still further for the more perfect filling. For the large pulp-chamber and as a foundation for the outer filling it is unsurpassed.—PERRY (S. G.), *International Dental Journal.*

PECULIARITIES OF A CRETINOID SKELETON.

BY CHARLES H. WARD, OSTEOLOGIST, ROCHESTER, N. Y.

Some months ago the partly macerated skeleton of what appeared to be a young child, was sent me by a correspondent in Wards's Natural Science Establishment, for preparation The cartilaginous character of the epiphyses, the non-union of the arches of several vertebrae with their centra, the proportions of the long bones, and, especially, the condition of the teeth, all bore testimony as to the extreme youth of the subject. On a subsequent business trip, however, the true nature of the supposed childish remains was learned, and photographs secured of the living subject. Briefly, it was a female, 22 years of age and a cretin, or, perhaps more strictly (as the photos show no signs of goitre) a semi-cretin or cretinoid. A protracted soaking of the cartilaginous epiphyses in a 2 per cent. solution of formalin, permitted their readjustment—although somewhat shrunken—to their corresponding diaphyses, and the skeleton was finally mounted in a life-like attitude. Certain peculiarities of structure forced themselves upon the most casual observer, many expressing doubts as to the *human* character of the remains.



Aside from the unusual lumbar curve of the spine and the disproportionate size of the head, the quadrupetal type of thorax was especially noticeable, the latter having *an antero-posterior diameter far exceeding its width*, as obtains in most quadrupeds, and preeminently in ungulates. The exceeding rarity of cretinism in this country may render the following laboratory notes of interest to the profession.

It may be noted, en passant, that the etiology of Cretinism is involved in obscurity. What true (goitrous) cretinism is accompanied by hypertrophy of the thyroid gland is self-evident, but *why* this condition of the thyroid affects the nutrition of the patient is not known, any more than *why* hypertrophy of the pituiary body should produce (or coincide with), acromegaly. It has been suggested that the thyroid body secretes something necessary to the proper nutrition of the body and especially of the brain. Having no duct, the only apparent outlet of this secretion seems to be through the blood-vessels, with which this gland is especially well provided. Some physiologists consider it the birth place whence emigrate the white blood corpuscles. Hypertrophy of the thyroid is hypothetically caused by retention of this nutritive secretion. Certain is it that in some mysterious way derangement of its functions causes an arrest of development.

Our present knowledge of the physiology of the part in question was thus tersely summed up by Hyrtl, who, while questioning his class, turned to Mr. B., a notoriously lazy student and suddenly asked, "Mr. B., what are the functions of the thyroid gland?" "H'm! h'm! Why really, Professor, I could have answered that question easily yesterday, but I don't recollect just now." Turning to the class, Hyrtl remarked slowly and impressively that a great misfortune had overtaken the medical world,—"Only one man, gentleman,—only one human being had solved this function of the thyroid gland, and he has forgotten it!"

The data of this case being entirely unknown to me, I will simply present the following extracts from laboratory notes:

No. 10,305, Homo.; sex, female; age 22 years; Cretin, Habitat, N. Y. State.

MEASUREMENTS.

Total height, 85 c. m. (33½ inches).

Length of vertebral column to promontory of sacrum, following anterior curve, 33 c. m.

Total length legs, 39.- c. m.

Total length arms, 36. c. m.

Greatest width, pelvis, 14.3 c. m.

Greatest width, shoulders, 15.5 c. m.

Greatest width, thorax (as mounted), 12.7 c. m.

Greatest width, thorax, at level of xiphysternum. 10.6 c. m.

Antero-posterior diameter of thorax, at level of xiphysternum, (outside measure), 14.1 c. m.

Femora have very prominent "third trochanters."

Epiphyses of lower ends of femora pretty well ossified; all others mainly ligamentary, arches of eight vertebrae free from centra, and sacral arches incomplete (open).

Tarsals and carpals show a few centres of ossification, but are mainly ligamentary.

SKULL.

Skull fairly symetrical. Sutures so entirely open that skull disarticulated during maceration.

Weight, basion to bregma, 103 mm.

Greatest width, 136 mm.

Length, inion to glabella, 174 mm., giving a cephalic index of 78 16, which brings her within the mesaticephalic class.

Width at zygomas, 106 mm.

Minimum frontal diameter, 94 mm.

Temporal ridge very low; greatest height, 9.8 c. m., from sagittal suture.

H-shaped pterion, with well-marked epipteric bones.

Height, right orbit, 28 mm.

Width, right orbit, 33 mm.

Distance between orbits, 25 mm.; metopic suture open.

Slight fissure remaining of anterior fontanelle.

Occipital still composed of 4 bones.

Temporal suture continued about 35 mm. inward on ex-occipital; no styloid processes.

Condyles very flat; mastoid processes hardly noticeable.

Foramen magnum diamond-shaped, 36 mm. long, 27.5 mm. wide, 6 or 7 Wormian bones.

Vomer inclines trifle to right.

Inferior turbinals (as may be seen in cut) are *very low* in position

General contour of nose negroid.

Nasal spine short, blunt and rounded.

Jaws prognathous; angle of gonion of lower jaw, 150 degrees.

Width of lower jaw at condyles, 96 mm.

Greatest width of superior arch (outside of molars), 53 c. m.

Dr. Harrison Allen in his examination of two cretinoid skulls* says: "In the second example I show you of cretinoid deformation the nasal bones, instead of being prominent, are inconspicuous; indeed, one may say that there is no bridge to the nose, for the nasal bones, instead of being inclined forward and downward, are vertically disposed, &c. * * * In both specimens the inferior turbinated bones are lodged *high up* in the nasal chamber, and give the impression of being of great size."

In the specimens now under discussion the nasals are undoubted-

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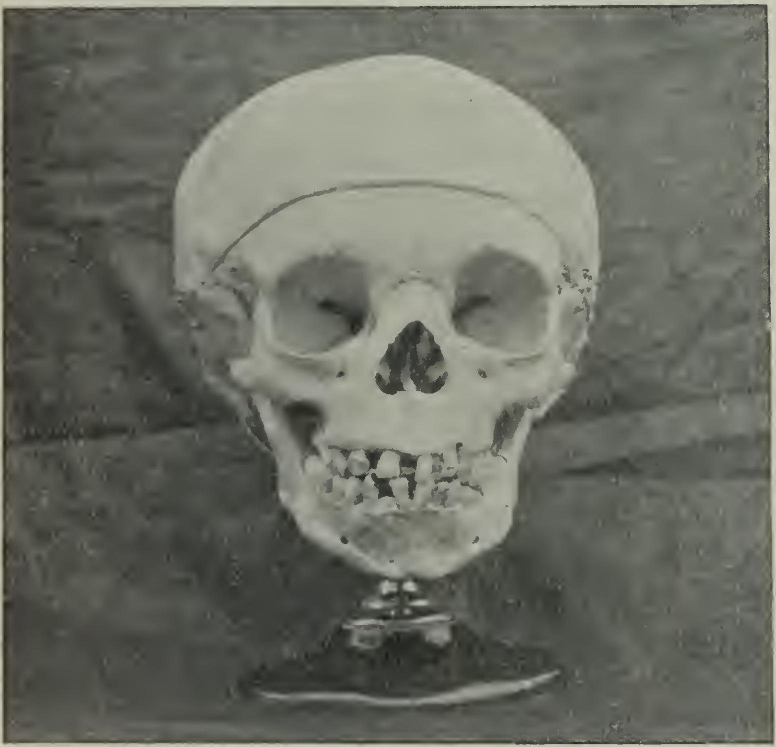
*Demonstration of skulls showing the effects of Cretinism on the nasal chambers. New York *Medical Journal*, Feb. 2, 1895.

ly flat, yet the nasal index of 64.7 (platyrrhine) the reduced nasal spine, smooth inferior border of the anterior nares, &c.—all negroid characteristics—are not borne out by racial inheritance, as the hair is decidedly straight. But our skull, contrary to Dr. Allen's specimens, shows inferior turbinals *very low* in situation. In the description quoted he adds "the suture between the halves of the frontal bones is apparent." This is also the case in our specimen, as may be seen in the front view of the skull. The development of the teeth was not only retarded, but abnormal.



In the lower jaw were the following teeth :

Two permanent median incisors, (distinctly tri-tuberculate); two deciduous lateral incisors (with permanent incisors developed in alveoli) ; two deciduous canines (with permanent canines developed in alveoli) ; two first and two second premolars (biscuspids) ; two first molars (having each 5 cusps) ; two second molars (having each 4 cusps).

The second molars were low and had probably not yet erupted ; the first and second *L.* premolars incline inward and forward, the root of the second having pushed out its alveolar wall in a sort of chamber projecting from outer side of jaw. *L.* lateral incisor and *R.*

canine have small cavities, the latter on the lingual surface, the former on either side of crown.

In the upper jaw, we find :

Left deciduous central incisor in situ, and with permanent central incisor erupted back of it and to a trifle *greater length* (labial surface of crown of latter crossed by carous groove).

Right permanent median incisor in situ and shows *L.* deciduous lateral incisor in situ, and with marked wear

Left permanent lateral incisor developed in a nearly horizontal direction forward, its crown impinging against deciduous tooth at nearly right angles, and root bulging out roof of mouth (superior maxillary) as far as pre-maxillary suture.

Right deciduous lateral incisor shed, and permanent lateral incisor seems to show through a minute hole in alveolar border of jaw.

Left deciduous canine in situ, and *L.* permanent canine developed *in front* of it, but not erupted.

Right deciduous canine in situ and permanent canine probably developed in jaw, (can't *see* it.)

Both right and left 1st premolars erupted.

Left 2d premolar erupted and rotated so that labial aspect faces nearly to front.

Right 2d premolar erupted (peculiar process below neck of tooth projecting anteriorly.)

Left 1st molar somewhat rotated (labial side to front), entire crown destroyed by caries.

Right 1st molar rotated as above and crown totally destroyed.

Left 2d molar slightly rotated, crown tri-tubercular (posterior border on line of palato-maxillary suture.)

Right 2d molar also rotated and tri-tubercular. Both second molars slant sharply inward.

Width of crown of inf.. 1st molar, 9 mm.; length of crown 10 mm. Total permanent teeth erupted, twenty.

Superior dental arch, horse-shoe-shaped ; distance between 2d premolars, 37 mm.; distance between 2d molars, 35 mm.

We have here a dental armature indicating—at the outside—not more than 9 years of age ; other data give even less age. The superiority of width at shoulders over that at hips, indicates the as yet sexually undifferentiated frame of childhood : the *proportion* between length of arms (36 c.m.) and of legs (39.5 c.m.) is one never found in the normal *adult*, but characteristic of the immature individual.

In a word, the arrest of nutrition has preserved the infantile character of the skeleton to the 22d year. The determination of either sex or age from the bones alone would be impossible.

SYPHILIS, WITH SPECIAL REFERENCE TO THE RELATIONS OF THE DENTAL PROFESSION TO THE DISEASE.

Many, if not most, of those present here this evening would probably assert quite confidently that they have never had a syphilitic patient in their operating-chairs. Yet I venture to state that there are very few busy dentists who do not unwittingly treat at least one syphilitic in the course of each year of practice. The disease is an extremely common one. In the practice of skin-specialists about one-tenth of all the cases seen are forms of syphilis, and in order of frequency it stands third upon the list of skin-diseases. As it is contracted by the rich and intelligent almost as often as by the poor and ignorant, you are always liable, no matter among what class you practice, to be called upon to treat some person who carries in his mouth the poison of the disease. If he happen to infect you, it means at the very least two years' abstinence from professional work, to say nothing of the social and domestic privations such as infection necessarily imposes. If, through you or your instruments, he infect one or more of your patients, it means great and possibly irreparable injury to you and to your practice. It should therefore be of the utmost interest to you as dentists to have accurate information about this disease ; and it is in the hope of adding to your stock of knowledge of the subject that I venture to present this paper to-night.

Syphilis is a chronic infectious disease, produced by a specific poison, which, in all probability, is a bacillus closely resembling that of tuberculois. Inoculation with this virus causes a speedy saturation of the whole system with the disease, and, except for the transient local reaction at the site of the inoculation, the malady in its subsequent course shows all the characteristics of a general, constitutional disease.

Syphilis may be acquired in several different ways : The germs may be deposited upon an abrasion, wound, or other solution of continuity of skin or mucous membrane. In the case of a woman impregnated by a syphilitic, they may enter the system through the placental circulation The child begotten by a syphilitic father is usually syphilitic, and a syphilitic mother generally brings into the world an infant who inherits her disease.

The germs of syphilis are present in the discharges from all the early eruptions and ulcerations, and in the blood, lymph, semen, and ova of those passing through an active stage of the disease. Infection through the unbroken epidermis, either of the skin or mucous membrane, is impossible. "The venereal disease" *par excellence*, syphilis, is usually acquired during sexual intercourse. Liability to the disease is practically universal, the only known immunity being that conferred by the disease itself, which protects the individual against a second attack. Very few prostitutes escape it, the majority of them being infected in the course of the first two years of their loose life. Hence it is most frequent where prostitution is rife, or where promiscuous sexual relations prevail.

After the expiration of a more or less definite period of incubation, infection with syphilis is followed by the development, at the site of the inoculation, of the "initial lesion" of the disease. This is first seen usually as a hard, painless papule, which soon breaks down into a shallow ulcer, secreting a scanty discharge, and causing considerable induration of the surrounding tissues. Such are the typical characteristics of the dreaded "hard chancre." The formation of this apparently trifling ulcer is a sign that the whole system is already hopelessly infected, and no local treatment, however heroic, can prevent the further development of the disease. Coincident with the appearance of this ulcer occurs the enlargement of the neighboring lymphatic glands, and within a short time a similar condition of all the glands of the body, together with the establishment of certain moderate constitutional symptoms, furnishes abundant proofs that the disease has indeed become general.

The eruptive period of syphilis follows the appearance of the initial lesion in from three to twelve weeks. It is ushered in by moderate fever, headache, pains in the joints and bones, and much general malaise. These symptoms are immediately followed by the appearance of an eruption occurring usually simultaneously on the skin and mucous membranes. The first eruption is commonly very superficial, consisting of spots of localized hyperæmia, like those of measles. It soon fades away, to be followed in the course of a few weeks by a second eruption, generally of a papular form. This in turn disappears, giving place, in a longer or shorter time, to still another and severer form of eruption. Thus the disease goes on, gathering strength as it develops, until the climax of the eruptive period is reached in a general eruption of pustules or boils, which may be so severe that small-pox, as its name implies, is trifling in comparison.

In the course of the eruptive period, which often lasts two or three years, there also occur many other manifestations of the disease. The general health fails, there is anæmia and loss of flesh and strength, there are ulcerations of the various mucous membranes, the hair falls out, certain diseased conditions of the eyes and ears may develop, and the bones and joints may become affected.

After the second or third year there is often a decided lull in this storm of symptoms. Sooner or later, however, the disease again makes its presence and power felt by new and severer manifestations. These, the so-called *tertiary* or *late* lesions of syphilis, differ decidedly from those which occur in the eruptive stage. They are rarely general in distribution, being confined to a limited portion of the body ; they are extremely chronic, each distinct attack lasting for months or years ; they often spread slowly, in a serpiginous manner, from the point at which they start ; they rarely secrete infectious discharges ; they often cause extensive destruction of tissue, which, occurring in important organs, may occasion a fatal issue ; they are more likely to attack deep-seated structures and vital organs than are the lesions of the eruptive period.

Fortunately for the many persons who contract syphilis, it is no more necessary for them to experience all the possible lesions of the disease than it is for a guest at a fashionable hotel to partake of every delicacy on the bill of fare. The majority of syphilitics have, besides their chancre, two or three moderately severe eruptions, a partial loss of hair, several ulcerations in the mouth or throat, and one of the slight or moderately severe late lesions. When properly treated from the first, the disease usually runs a rapid and benign course, leaving its victim somewhat impaired in health, to be sure, but only exceptionally a physical wreck or chronic invalid.

The foregoing brief sketch will give you some idea of syphilis as it is seen by physicians. Dentists, in the practice of their profession, naturally see much less of the disease ; but that they have occasional opportunities for observing many of its characteristic lesions there can be no question. On the lips they may possibly see the initial lesion ; for, although of rare occurrence, chancre of the lip is the most common of all extragenital chancres. More rarely still they may meet with a chancre of the tongue, of the tonsil, or of some part of the face. The characteristics of all these lesions are similar in whatever locality they occur. The ulcer may be as small as that of the ordinary chapped lip, or it may be as large as an inch in diameter. The most constant characteristics of the syphilitic chancre are the parchment like induration of the underlying tissues and the painless enlargement of the nearest lymphatic glands.

In the eruptive period the dentist may see such of the eruptions as occur on the head and neck, the ulcerations and eruptions in the mouth and nose, and the diseases of the eyes. One of the most typical of the facial eruptions is the so-called "corona veneris," a well-marked semicircle of large papules crowning the forehead just below the line of the hair. The presence of this eruption, with a decided thinning of the hair on the sides of the head, is pretty strong proof of syphilis. Another characteristic manifestation of syphilis which a dentist may see is the "angina syphilitica," or syphilitic sore throat. It is a vivid, raw, ham colored hyperæmia of the pharynx, tonsils, and soft palate, which is limited by a definite margin, especially well marked just above the uvula and the free border of the soft palate. Portions of the inflamed areas may be coated with a grayish layer of dead epidermis, or even superficially ulcerated. The most common locations for the oral ulcerations of this stage of the disease are the angles of the lips and the tip and margins of the tongue. Associated with these ulcerations, or occurring independently of them, may often be seen red spots, generally circular in shape, having sharply-defined edges, and flecked with a grayish deposit of epidermis. All syphilitic lesions of the mouth seem more apt to occur upon parts subject to continual irritation, such as that produced by a cigar or pipe, by a plate for artificial teeth, or by the roughened edges of broken or carious teeth. Clean and well-kept mouths are less liable to these complications than are foul and neglected ones.

The most common oral lesions of late syphilis are perforations and destructions of the hard and soft palates. They are almost always accompanied by a very offensive nasal catarrh. Deep ulcerations of the tongue and tonsils may also occur in this stage. It is always satisfactory to remember that the discharges from all these destructive ulcerations are usually quite harmless, and incapable of producing the disease in another person.

Not the least of the dangers of syphilis are the diagnostic difficulties which it offers even to the inexperienced physician. If it were possible to give you an infallible rule by which you might detect the presence of the disease, it would, as far as you are concerned, be robbed of many of its perils. Unfortunately, however, there is no such rule. The most innocent-looking lesions sometimes prove to be syphilitic, and the most suspicious in appearance frequently turn out to be harmless. Even physicians who are familiar not only with syphilis, but also with the many diseased conditions with which it may be confused, are occasionally mistaken in their diagnoses and misled by appearances. Therefore, as a dentist is not necessarily an experienced syphilographer, he will scarcely attempt to make his own diagnosis of an unusual oral condiion, but will in all such cases get the opinion of a competent physician.

A dentist finding himself face to face with a syphilitic patient who needs dental treatment has two courses open to him: he may refuse to take the case, either setting him adrift or turning him over to a less fastidious colleague, or he may accept and treat him just as he would any other case that comes to him. Now, I have neither the desire nor the presumption to lay down the law as to the conduct of the members of your profession, either under these or any other circumstances. I hold that every man, whether he be a dentist or a physician, has a perfect right to use his own judgment as to what cases he ought to treat and what cases he ought not to treat. This is his business. You can scarcely accuse me of meddlesome interference, however, if I merely place before you fairly and squarely the *pros* and *cons* of this matter.

In the first place, you may urge that you are justified in refusing to treat syphilites simply and truly on account of the personal risk incurred. This is perfectly true, and the argument is unanswerable. But it is well to bear in mind that you do not avoid this risk altogether by refusing to treat such persons as you know are syphilitic. As a class, syphilitics need a great deal of dental treatment, and they generally contrive to get it sooner or later. Some do so innocently, being ignorant of the nature of their disease and of the risk they are imposing upon the dentist. Others are aware that they have syphilis, but do not know that they have infecting lesions in their mouths. Still others know all about their condition and its dangers, but do not care how much injury they inflict upon their fellows; they will shamelessly lie about themselves, and, in order to hoodwink the dentist, will try to mitigate and conceal their symptoms, as prostitutes do when syphilis threatens to ruin their business. It is thus quite evident that a dentist escapes only a part of the risk of infection by refusing to treat cases which he knows are syphilitic; for in the recognized cases of the disease he can, by taking proper precautions, easily avoid infection; but where he does not suspect it he will naturally be more or less off his guard.

That a dentist ought to refuse to treat syphilitics from fear of infecting other patients is a good pretext, but can hardly be made a substantial ground for argument; for, as I have already said, in speaking of the personal risk, so also may I say of the risk to your patients, that it cannot be altogether avoided by refusing such cases. In the second place, in these days of wide and growing knowledge of germs and germ-diseases, when we all know that the mouth is a perfect hot-bed of bacteria, a dentist is surely not guiltless if he fail to take the simple precautions which will make it almost impossible for him to carry any germs whatsoever from the mouth of one patient to that of another. A dentist who always thoroughly cleanses his hands and sterilizes his instruments before working upon each patient runs very little danger of transmitting syphilis or any other infectious disease. I will not deny, however, that it would be the part of wisdom for dentists who knowingly do much work among syphilitics to have, as many physicians have, a set of instruments for use only on such cases.

A third argument which I have heard urged against the treatment of syphilitics is the "social-morality" argument. Some "good" people argue that, as syphilis is invariably contracted through gross immorality, it is the duty of every true Christian, whether he be dentist, doctor, or preacher, to prevent the wretched sufferer from obtaining the slightest comfort or relief under this visitation of a justly incensed Providence. Of course, you all know that this is nonsense. A syphilitic is very rarely a more grossly wicked man than the majority of his fellows, unless he has been made to feel that he is a social outcast. I have known young men who acquired the disease in their very first step aside from the path of virtue; I have known good women—wives and mothers—who have been infected by vicious husbands; and every one of you know men who, in spite of long lives of licentiousness, have escaped this scourge.

We of the healing professions will do well if we let theology and casuistry alone. It is not our business to punish men and women for doing evil, but, as far as in us lies, to cure and to prevent disease. Even if we should all unite in refusing to treat these troubles, we should not only fail to advance the standard of social morality, but would inflict untold suffering upon countless innocent persons. There is too much syphilis, too much gonorrhœa in the world. These maladies are not weeding out the vicious from society ; their prevalence is not improving the human race ; on the contrary, it is making it worse. Constitutions are undermined, individuals are weakened physically, mentally, and morally, and their offsprings are weaklings, unable to resist either disease or temptations. Let the clergy do their part in preaching sexual purity to the people ; but let us also do our part, which is the curing of these diseases and the stamping them out of existence. With reference to venereal diseases, it always has been and always will be my practice to make treatment and relief as easy and as accessible as possible for all the afflicted. I do this not from any feeling of weak sentimentality for the sufferers, but for the benefit of humanity at large. Every syphilitic is a centre of infection, and carries with him the possibilities of infinite mischief to his fellows. If our laws permitted it, we should do well to incarcerate such persons, and subject them to proper isolation and treatment until they were cured ; but as we are too fond of what we call "personal liberty" to do this, let us at least do our best to cure them,—and that, too, as speedily as may be.

In the scientific treatment of syphilis the dentist may, if he will, play a very helpful part. If all things were done as they should be done, the first step in the treatment of a syphilitic would be to send him to a dentist to have his teeth and mouth put in as good a condition as possible. This can in most cases be done before there are any infectious lesions in the mouth. Then, when the physician comes to put his patient through the courses of mercurial treatment, which are so essential to a thorough cure, there will be little danger of the occurrence of salivation or stomatitis, which check treatment, and make the remedy seem as bad as the disease. When the ulcerations attack the mucous membrances, there will be no severe lesions in the mouth from carious, jagged teeth. In short, if a syphilitic has a mouth filled with smooth, clean, healthy teeth, it is easy to cure him ; but if his teeth are dirty, ragged, and carious, his cure is always difficult, and sometimes impossible.

If dentists as a class refuse to do their small but important part in the treatment of syphilis, they are working against those who are trying to exterminate this horrible disease. If they wish to help us who are doing our best to rid society of this scourge, they will put to one side all thought of personal risk, and, confident in their knowledge and skill, will cheerfully undertake and accomplish their share in the good work.—PULSFORD (H. A.), *International Dental Journal.*

THE SUREST TREATMENT TO SECURE ROOT-CANAL STERILIZATION.

Dr. Jarvie.—The two questions that are presented for our consideration this evening are of such importance that if they are answered rightly, and the answers of such a character that the *modus operandi* can be put into practical operation and carried into effect by the average dentist, much time and suffering will be saved by the public, and much trouble, annoyance, and discomfiture by the dentist ; for no class of teeth with which we have to deal causes so much pain to the patient and so much dread and uncertainty and perplexity to the operator as that which requires " sterilization of the pulp-canal " and " complete obliteration of the root-canal by filling."

The question, " What is the surest treatment to secure root-canal sterilization ?" is the one given to me upon which to speak ; but the time for preparation has been so short that I shall not attempt an exhaustive treatise upon the subject, but content myself by placing before you, in as simple and as brief a manner as possible, the process I employ and the agents I deem best fitted to bring about the desired result.

The word " sterilization " which occurs in the question would imply that germs are already in existence, and the pulps in a state of putrescence, in the class of root-canals the treatment of which we are to discuss this evening, thus eliminating from the discussion that class of root-canals from which recently devitalized pulps have just been extirpated.

In treating the class of teeth in question, such a course must be pursued that not only the root-canals shall be completely sterilized, but that the contents of the tubuli shall be sterilized also, otherwise the contents of the tubuli may become decomposed and form gases which, having no outlet into the pulp-canal, may force their way out through the cementum, and thus become a constant source of irritation to the pericementum and a subsequent cause of the loss of the teeth. It is seriously questioned by able pathologists whether there is organic matter enough in the tubuli to bring about any such result, but as long as there is the slightest doubt in the matter we should so treat canals and tubuli as to reduce danger from this source to a minimum.

The conditions existing in the root-canals of teeth requiring antiseptic treatment are so different from the conditions existing in almost every other part of the body that treatment which would be proper and successful everywhere else fails utterly in root-canals. In wounds, burns, abscesses, tumors, and in almost all septic conditions the parts are more or less readily accessible ; large quantities of the antiseptic may be used as compared to the septic surface, and thus an agent that would be altogether too weak to penetrate and asepticize putrescent matter found in root-canals would be successful. An antiseptic with penetrating qualities powerful enough to permeate putrescent pulp-matter to the uttermost end of a small root-canal has such injurious effect upon tooth-structure as to render it useless for our purpose ; therefore thoroughness of mechanical or surgical removal of all putrescent matter in the canals must be depended upon for success rather than therapeutic effects.

To remove all putrescent matter, use paper points, barbed broaches, shreds of cotton, etc., and as much as is possible enlarge the small canals with square or five-sided Swiss watch broaches. Neither the number of sittings nor the lapse of time is to decide as to the termination of the treatment. Entire removal of septic matter, thoroughness, completeness of this part of the work is the absolute *sine qua non*, and this can be accomplished at one sitting as well as at a dozen.

With heat, dry the root of the tooth as much as possible. The method I have employed recently, the idea of which I got from Dr. Van Woert, is to roll a piece of copper wire so that the small end is fine enough to penetrate and flexible enough to follow most canals. Insert the wire into the canal with the other end protruding from three-quarters of an inch in the case of a front tooth to possibly two inches in the case of a back tooth. Heat the bulb of an Evans root-dryer, having first removed the point, until it is quite hot, and then insert the protruding end of the wire into the hole in the bulb. Copper being a good conductor, the heat from the bulb will be conducted to the extreme end of the wire, and you will thus get a condition of dehydration in the root-canal and tubuli such as cannot be obtained in any other manner that I am aware of. This method of heating the root-canal is much superior to the ordinary one of a blast of hot air from a syringe, a method by which the crown of the tooth is in danger of being broken by excessive dehydration, while the hot air penetrates but a very short distance into the root-canal, where the dehydration is desired.

The root-canals being now freed from septic matter and the tubuli and canals as dry as possible, they are in the best condition to receive and absorb the antiseptic selected to be applied.

Accepted authorities differ as to the best agent for this purpose, but I think nearly all will agree upon one of the following four as the very best,—viz., carbolic acid, chloride of zinc, oil of cinnamon, and oil of myrtol. The experiments of Professor Miller, of Berlin, give the penetrating properties of the first three in the order I have placed them. I do not know that he has experimented with the oil of myrtol, but he places carbolic acid and the chloride of zinc ahead (in this property) of any of the essential oils. Professor Harlan places a high value upon the oil of myrtol, and prefers it to any other antiseptic as a root-canal dressing, claiming that the essential oils are much superior to any coagulating agent; in fact, denying the use of any coagulant, claiming that the coagulum formed at the end of the tubuli next the canal prevents the entrance of the antiseptic, and so permitting the contents of the tubuli to continue septic, with all the consequent evils.

On the other hand, Professor Kirk has apparently demonstrated that the coagulum found at the mouth of the tubuli becomes a medium by osmosis, for the penetration of the tubuli by the antiseptic.

In this condition of things, where two men, so eminent, each apparently proves the other wrong, each one of us must rely somewhat upon the clinical results of the observation in his own practice. I have been successful with carbolic acid; but if the preparation of the canal has been thorough up to this point, I have no doubt but that you will be quite as successful with the oxychlorid of zinc, or the oil of cinnamon, or the oil of myrtol.

Now, gentlemen, I know that it is much easier to write how to remove all septic matter from root-canals than it is to do it. I know, too, that in some cases it is an utter impossibility; but I know, also, that the nearer we approach the perfection of the treatment I have attempted to describe, the nearer we will have complete success in results.

Dr. Darby answered the question by stating that he used sulphuric acid and hot air (bicarbonate of soda after the acid).

Dr. Louis Jack.—My answer to this must require the subdivision of cases into those freshly devitalized and those which from any cause have become infected.

In the first class my reliance has been to freely use aristol to saturation with oleum gaultheriæ, and to fill the canals as soon as possible. I should state this is done as soon as all of the pulp-tissue can be removed.

In the second class the question is not so easy, and no one substance can, in my understanding of the subject, be always depended upon. To well consider cases of this kind, they should be arranged in several classes, to meet the various conditions which are presented. The most important consideration is not to force the infectious matter contained in the canal through the foramen, and to avoid the use of infected instruments. I consider it safer to oxidize the contents of the canals with permanganate of potash, by inserting a small crystal, and permit it to decompose the organic matter present, and afterwards to carefully cleanse the canals, following with aristol and oleum gaultheriæ in cases where pus is not present.

Should pyæmic conditions exist, my reliance is upon zinc chloride five to ten grains to one drachm of water, or formalin five per cent. solution, in all cases following with aristol as before.

I am careful to avoid the use of irritating medication, and believe better results follow the above line of treatment than when more active remedies are employed, such as pure carbolic acid and corrosive sublimate.

The larger my experience grows the more I am convinced that the greater difficulties of sterilization are neutralized by the lack of the perfect cleanness required at all stages of the treatment. The force of this principle was impressed early upon me by the rules of Dr. Maynard in the treatment of devitaltzed teeth. His major consideration was that surgical cleanness was of the highest importance, and after this the perfect obliteration of the root-canals. In the treatment of this class of cases Dr. Maynard was super-eminent. His results were produced by the greatest care in the treatment, and the utmost patience in the subsequent closures.

Dr. E. C. Kirk.—By the application of (1) a saturated solution of sodium peroxide, and (2) twenty-five per cent. pyrozone.

Dr. A. W. Harlan.—Repeated washings of the root-canal, first, with neutral peroxide of hydrogen or pyrozone; second, with cinnamon-water or peppermint-water. Dry the interior and introduce a strand of silk or cotton wet with myrtol; seal this in the cavity for one or two days with gutta-percha. After this is taken out, do not let saliva or water get into the root. Fill it.

Dr. C. N. Peirce.—For sterilization there are a number of antiseptics which work with almost equal efficiency. Electrozone and pyrozone have both done good service; but for thoroughness in removing all decomposing organic matter there is nothing which goes to work with a determination to clean out everything which is impure as does the sodium peroxide. I have no hesitation in putting a minimum portion of this in the root, and, covering it over with gutta-percha, letting it revel for twenty-four hours; then I wash it out with dilute sulphuric acid.

Dr. H. S. Guilford.—Root-canal sterilization can, I think, be best secured by first removing with a drill (where possible) a portion of the most infected dentine bordering the canal, and then subjecting the remaining portion of the dentine to the action of some sterilizing medicament that will be rapid in its action, efficient, and non-injurious to tooth-structure.

Mercuric bichloride, while it stands first in the list of germicides in laboratory experiments, has fallen far short in its efficiency in actual practice. Carbolic acid has produced better results at the hands of the majority of practitioners than many other agents with a higher laboratory record ; while iodoform, which Professor Miller claims is not a germicide at all, has at the hands of the writer produced better results as a root sterilizer than any drug he has ever used.

Dr. John S. Marshall.—First, thoroughly remove all pulp *debris* by broaches wrapped with fibres of cotton. Second, disinfect with ninety-five per cent. carbolic acid and dry the canal. Third, flood the canal with absolute alcohol and evaporate with hot air until thorough desiccation is obtained. I succeed best by these means. The rubber dam is indispensable in all cases.

Dr. McQuillan.—In treatment of infected canals I have had the best results from the use of sodium and potassium, followed with twenty-five per cent. pyrozone, three per cent., and thoroughly drying with hot air. I have never had so much satisfaction as in the last two years, when I first began the use of this method, which was suggested by Dr. Shreier, of Vienna.

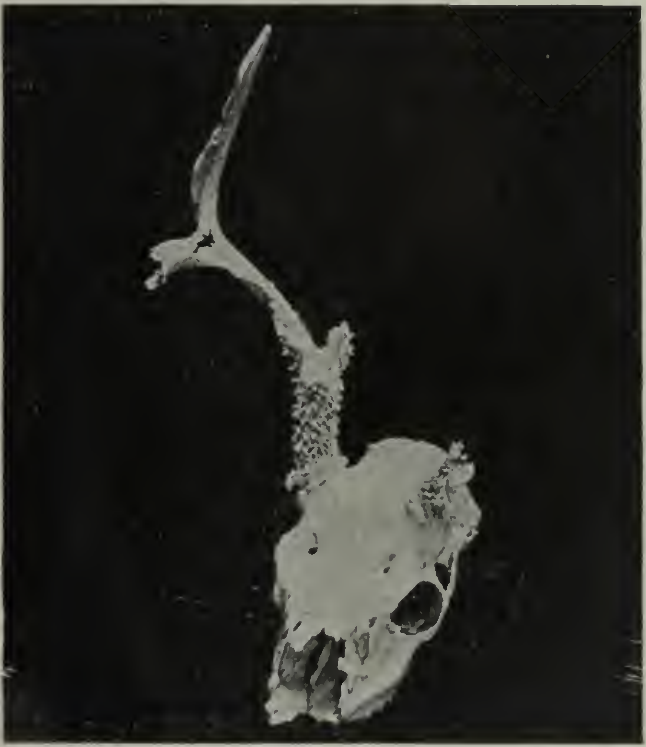
Dr. Littig.—Thoroughly cleansing and drying. The kind of drug employed makes but little difference as to whether it is coagulant or not.

Dr. Crawford.—The surest treatment to effect root sterilization is first to isolate the tooth by the use of rubber dam ; dry the cavity and as much of the canal as possible before proceeding to cleanse the same of foreign contents ; in the first explorations be certain to avoid too much pumping with medicated swabs. *Use bichloride of mercury not stronger than one to three thousand* to frequently wipe out the canal during the operative procedure, so as to keep sterilizing all the newly-infected particles that may occur. When the canal is thoroughly cleansed and made perfectly dry, close it up for a few minutes with a dry tampon of cotton to give the last wiping of bichloride of mercury time to act upon any bacilli or micro-organisms that may be present. If it is desirable to test the condition of asepsis thus produced, I would recommend the thorough packing of the canal with cotton saturated well with pure *German beechwood creosote*, as this is the best antiferment that has ever been placed in the canal of a pulpless tooth. In addition, it certainly has some anodyne effect upon the peridental membrane when it is coincidentally involved as a result of a septic condition of the contents of the pulp-canal.

Dr. Black.—Pack with oil of cassia or some mixture containing it in sufficient proportion, not less than one-sixth. The 1, 2, 3 mixture is my standard. Close the cavity perfectly with gutta-percha,—no cotton or gum,—moistening the walls with eucalyptus first, and let it remain one week. Put on the dam before beginning and before removal at the end of time.

ANTLERS AND RODENTS.

What becomes of the deer antlers is answered, at least in part, by the following communication to *Forest and Stream*, by that mightiest of the many hunters of the VIIth District Society, Dr. J. W. Cowan, of Geneseo. The cut is kindly loaned us by *Forest and Stream*, one of the best papers in the world dealing with the subjects and objects of rod and gun. The specimen is now the property of the dental department of the University of Buffalo, having been donated by its discoverer and captor, "Caribou:"



We have heard a good deal at one time and another as to what becomes of the deer horns after they are shed, and now I'm going to tell you what happened to part of one pair that never had been shed.

My guide and I were making our way down a big beaver meadow in the Wahnaputac Lake region of Ontario one evening a few weeks ago, and were just thinking of putting up our little Protean tent and going into camp for the night, when the guide held up his hand with a "Hist!" Listening, I heard a strange, rasping sound, apparently a hundred yards or so to our left in the bush. Dropping our stuff on the ground, in we went to investigate; and as we advanced the crunching became louder and louder. It sounded exactly as though some fellow with heavy, hobnailed boots was shuffling over a cobblestone pavement. The guide whispered: "Well, I'll be strung up if ever I heard such a noise as that before in the bush;" and for myself I began to think a good gun would be about the proper article to have along just then instead of an axe and a kodak.

After considerable sneaking and crawling we managed to get to the edge of a little clear place, from which the sounds came; and then we both laughed, for there was only an old fat porcupine (probably *Erethison dorsatus*, otherwise known as Canada porcupine, otherwise urson of eastern North America), chawing away at some white bones. He paid no attention whatever to us, but went right on at what he was about; and on looking closer we saw that he was eating one of the horns of a big buck, which evidently had been killed by the wolves in the winter.

We watched the brute chew up almost all of one horn and begin on the other. I brought the skull and what was left of the antlers out with me, and think it is quite a curiosity. I send it by express to you, so that if you care to, you can make a cut of it. You will notice that the marks of the porcupine's teeth are almost as sharp and clean cut as though made with a chisel. CARIBOU.

Recent experience in a few small towns "taken in" in the course of a little vacation has confirmed us in the opinion that for "wrinkles" the dentist of the city is not to be mentioned the same day with his brother of the places in question. Whether from choice or necessity the dentist of the smaller cities and villages is always in the best possible form to meet the requirements of the most difficult case. If at all up to date, he is inventive, mechanical, self-reliant, has the time or makes it, does his patient a good service and himself and his profession great credit. Accepting for the moment the classification of dentists into city and country, the man in pursuit of practical knowledge for every day use will gain more in a day of the latter than it is possible to obtain in a week of his friend of the city. Both are willing to give of their store, but our country friend is an enthusiast and will stop any time to show his visitor how *he* does these things. Our advice is to visit him whenever you can; but don't forget to see *him* when *he* happens to call on you. You will learn something even then.

THE ODONTOGRAPHIC JOURNAL

CONDUCTOR'S DEPARTMENT.

A. D. A. NOTES PICKED UP IN THE LOBBY.

—The reading of the papers and their desired effect on those who strained their ears to hear would have been greatly enhanced if the several authors had reduced their product to type-writing and read it to themselves a few times before attempting to work it off on the Association. The otherwise good results are often lost in the struggles of the author to make out his own penmanship. More than that, dentists are none to good as readers of type-written or even printed matter. Public reading and speaking are not mere incidents of office practice, hence the necessity of legible manuscript. It may be mentioned in this connection that one paper went by the board wholly for the simple reason that the author could not be present and not a man of those who had had a glance at the manuscript dared to make the venture at reading it. What made it worse, the name of the author favored the presumption that the paper was a good one.

—It was suggested that the committees to whom papers are usually submitted before being read to the association should exercise their prerogative and eliminate much that is merely prefatory, all that is nonessential, and finally abstract all that is valuable but too long drawn out. Matter seems to be accumulating year by year and the necessity of some such radical effort on the part of those in authority is growing more and more apparent as a mere time saving expedient, to say nothing of the rescue of the ideas of the production from entombment in words and phrases that their author had neither the time nor the disposition to erase. The blue pencil as a dental instrument should be wielded by the committees' master hands.

—The intonation of some of the readers was just a bit singsong-like, therefore suggestive of the kind of preaching that rates with some clergymen with the wearing of a white tie as the sign of a touch of insanity.

—Some of the speakers failed utterly to make themselves heard beyond the first few rows of chairs. This was not wholly their fault, however, for the old Auditorium was as hollow as a drum and a great deal more resonant; in short, its acoustic properties were most wretched. In view of this all but universal failing especially in partially filled halls, it might not be a bad plan for the presiding officer to admonish the reader or speaker to address himself and his remarks to the back seats. In shooting at the most distant those between could hardly help hearing at least the whiz of the shot.

—Asbury Park is a delightful place in many respects, but the fact that the hotels are small, scattered, and filled with other than those concerned in dental meetings, make it less desirable for dental purposes than other, smaller and less popular resorts. The scientific and practical features of these meetings is conceded, at the same time the social aspect is not to be ignored. In fact it was reverted to in season and occasionally out, as the one thing that had brought together the majority of the old time members. On this occasion, however, it seemed out of the question to find anybody out of meeting, and in the meeting handshakes and other forms of renewal of old acquaintance and friendships were of necessity short, formal and unsatisfactory. These unfortunate circumstances were not unfrequently alluded to in conversation in divers places, and the possibility of overcoming it in the future freely and somewhat warmly discussed. The concensus of opinion favored small places without counter attractions, large hotels contiguous to each other, and the accomodation of as many in one hotel as possible. Niagara Falls was advocated as an ideal place, one that could easily meet all the requirements. The Association, however, took another view of the matter and decided to go next year to Saratoga.

—The exhibits were numerous, individually large, remarkably varied and complete. Their disposition about the room was a happy conceit on the part of the committee from New Jersey.

—The recitation of doggeral was one of the things that made a break in the flow of reason the first evening, and notwithstanding the loss of time its perpetration involved the Association took the effort with apparent complacency. The function of doggeral in serious argument, assuming it has a place there at all, is to point or emphasize the position taken by the speaker or ridicule that of his opponent, and to that end should be most apt and consist of but a line or two. Doggeral long drawn is not only flat but a bit nauseating. It is assuredly dangerous stuff to play with.

—It is still a serious question with some of the membership whether the display of dental supplies should be continued as a feature of the Association's meetings. Much may be said on both sides of this old time matter of dispute, and this being the case the chances of a continuation of the exhibits is good for at least a few years to come. In time they will become obsolete, especially when the membership grows less dental and more stomatological, which is another way of saying less practical and more scientific. The transition may be slow but, according to some, it is inevitable.

—The band played, as we had said it would, but as a compliment to the Association by the Mayor of Asbury Park. The abrupt ending of its effort left us in doubt as to whether the piece was "Anything to beat Barrett," or something else. It sounded like something else. When the fact had been communicated to the Association that the band was present, some one moved that the Association adjourn. The gentleman having the musical part of the programme in charge evidently misunderstood the result or did not hear it, and at his beck the band started in to beat its own great record. Then, to quote the poet, "Pandemonium reigned;" President Crawford pounded his desk till the splinters flew; several members rushed down the aisles shouting "Stop that band?"—Dr. Crouse in the van as ever. The band did stop and its members, facially wreathed in disgust, scattered as if for their homes. This, however, was not to be, for they were got together again, this time at the Columbia, where all present were entertained with some of the band's best efforts. As to "Who started that band?" opinions differ. Some of the members with a temper were wholly in the dark in their reflections on at least two gentlemen whose names we heard mentioned,—one of them a thoroughly professional man, the soul of honor, and whose attempts at appreciation of a practical joke are far fetched; the other, a prince among dental politicians, abundantly capable of extracting from the scene his share of the fun, but in this case as innocent of bad intent as the writer himself. This we know, for they were under our eye the whole time, as was the gentleman (shall we say from Jersey?) who innocently or out of mischief set the brass and reeds to going. The Association, however, carried the day. the band was suppressed, the rights of members in meeting assembled, likewise the dignity of the Association, were vindicated. To the looker on this was the most wakeful moment in the whole meeting. The summer boarders who happened in enjoyed the episode immensely.

—One of the social events of the gathering was a complimentary hop to guests and their friends by the proprietor of the Columbia. This hostlery had served as headquarters for the New Jersey Society and was utilized to an unlimited degree for the same purpose by the Association. The hospitalities of the occasion were dispensed with a most liberal hand. It goes without saying that the moving spirit thereabout came also from New Jersey.

—The big turtles claimed some attention, the lately deceased because of its enormous size and correspondingly great weight—875 pounds. Members and others who stood about were at loggerheads while th re.

—Those who suffer by the summer's heat are not among the friends of these hot weather gatherings. To and from Asbury Park proved hot to suffocation and dusty beyond compare. The trip should be attended by many a short rest to put one in condition to be reasonably constant in attendance at the Auditorium, and evenly fairly attentive to the papers and discussions. Interest here as in many another place seems to be largely a question of temperature.

—Visitors to the cyclorama of Jerusalem were highly entertained by the native lecturer, especially that part of the discourse in which he pictured the progress of the pilgrim through the "slouch of despond." The number and rarity of things done, merely "that it might be fulfilled," was truly remarkable.

—There were no bloomers at the meeting, but a near-by accident caused quite a stir. The "populace" uprose as one man, and "The policeman blushed till his helmet smoked."

PELLETS.

The *Leucocyte* is a students' paper of the Detroit medical college. Seems to be a good one.

Pacific Stomatological Gazette is the new name of the *Pacific Coast Dentist.* Same baby, but more "robustuous." We greet thee

The Dental Department of the Baltimore Medical College is the newest candidate for the inestimable privilege of teaching the very fresh dental idea how to shoot.

Dentistry now and then finds questionable mention even on the stage: "Even as we thank the gentleman who pulls our teeth," says Otis Skinner, as *Villon*, in his new play of that name.

The Microscopical Journal people are about to issue an index to the entire fifteen volumes of that periodical,—'80 to '94. To present subscribers it will be free; to others one dollar.

"The late editor's wife is something of a humorist." "Indeed?"

"Yes; took a line from his original salutatory and placed it on his tombstone.' '"What was it?" "'We are here to stay.'"—*Atlanta Constitution.*

An exchange concludes a criticism of "The ideal medical college" thus: Let us teach facts as long as the facts hold out and not deluge the feeble minds of our youthful deciples with a lot of stuff that "aint so."

The *Dominion* has done it now. Not content with setting Drs. Bonwill and Flagg by the ears by crediting one of them with the other's essay, it says "Dr. Garrett, of Newkirk, says of pyorrhea," etc. Heavens, what a break!

Dental matter is getting into the more progressive of our medical exchanges; good matter, too. For example, in the *General Practitioner* for August, Dr D. W. Fellows writes intelligently and at length "On some forms of toothache, their diagnosis and treatment."

Attention is again called to the fact that we are still in need of copies of the *Dental Record*, also the *New England Dental Journal*, and the *Dental Miscellany*. Lists of the special numbers needed will be sent to those having on hand odd copies they would like to dispose of.

A comparatively recent addition to the list of antiseptics bears two labels,—the first the name of the article, the manufacturer and his American agents; the second, a bit of information that stamps the fact of importation beyond a peradventure. This latter reads: "Not qualified for internal use."

Gen. Sherman says in his *Memoirs* that the soldiers in his armies did not take kindly to the many patent foods then in the market. Dessicated vegetables and concentrated milk they transformed into "Desecrated vegetables and consecrated milk," but would none of it when other and more familiar forms were to be had.

College news is always acceptable, but as it is of more consequence to the colleges than to us the ODONTOGRAPHIC cannot be expected to go after it. Changes in the faculties, improvements in buildings, new teaching material, modifications in methods, doings of the several classes, are among the things dental readers would know something of.

According to the *Microcosm*, Dr. Samuel J. Hayes, the editor thereof, discovered anesthesia by rapid breathing, otherwise analgesia, and communicated the same to Dr. Bonwill who sometime thereafter and in divers places did publish or cause to be published said discovery as his own, likewise taking all credit therefor. Now —the affair in Texas seems to be losing interest.

If you admire pictures with character written all over them, get a copy of Remington's *Pony Tracks.* The artist is great at description, too. Droch, of *Life*, who can tear more out of a book in ten lines than the majority of reviewers do in as many pages, speaks ot him as a man "who can put his sensations and experiences into bullet-like words that have a habit of hitting the target."

To complete our file of the *Dental Record* we must have a full year's numbers of '81, March and May of '82, and April of '86. Look through your garret, my dear fellow, and see what you can do for us, otherwise it may become necessary to remind you personally of the time that we did the dusting act for you. The Messrs. Ash & Sons did handsomely for us in England, but we are still short the specific numbers mentioned above.

Gen. Sherman says : I would define true courage to be a perfect sensibility of the measure of danger, and a mental willingness to incur it, rather than that insensibility to danger of which I have heard far more than I have seen. The most courageous men are generally unconscious of possessing the quality ; therefore, when one professes it too openly, by words or bearing, there is reason to mistrust it. I would further illustrate my meaning by describing a man of true courage to be one who possesses all his faculties and senses perfectly when serious danger is actually present

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It took some time to tell the story, but it certainly ought to interest the rank and file of dentistry to know that the Army Medical Museum at Washington has assigned a part of that noble institution for the deposit of anything and everything of interest pertaining to dentistry,—natural preparations, models, instruments, appliances, apparatus, etc. It ought to be possible to fill the alloted space in a very short time with material of the best and most interesting and instructive kind. Packages sent to the Surgeon General will be cared for and duly acknowledged.

During the last hours of Daniel Webster, Mr. Adams called, and seeing his desperate condition and wishing to cheer him a bit, said to the dying statesman: "Good morning, Mr. Webster; I hope you are doing well." Mr. Webster's eloquent though sad reply was, "Mr. Adams, I am sorry to say that I am not. I feel that I am the tenant of a house sadly racked and shaken by the storms of time. The roof leaks, the windows rattle, the doors creak on their hinges, until my mansion seems almost uninhabitable. But the saddest part of the situation, sir, is that I have received word that the landlord positively refuses to make any further repairs."—*Annals of Hygiene.*

SOCIETIES.

Dr. E. P. Beadles, corresponding secretary of the Southern Dental Association, writes us as follows:

"The next annual meeting of the Southern Dental Association will be held in Atlanta, Georgia, commencing the first Tuesday in November. Arrangements are being made for the greatest meeting in the history of the "Southern." The Cotton States and International Exposition will be in progress and railroad rates will be very low. All friends will be given a hearty welcome."

The union meeting of the VIth, VIIth and VIIIth district societies will be held at Binghamton, October 29th, 30th and 31st. The joint business committee has a large contract on hand, but is abundantly capable of meeting its terms to the letter, and with the help of the members of the several societies will present a program well worthy the occasion. It has been suggested that essayists have their papers ready for study by those designated to open the discussions. This is not only fair to the primary discussers, but essential to the bringing out of all the good the papers may contain. Applications for membership should be filed with the censors of the district in which the applicant resides at as early a date as possible. Railroad certificates should be obtained on starting for the meeting, otherwise full fare will have to be paid both ways.

PERSONAL.

Franklin E. Howard, M. D. S., D. D. S., late professor of operative dentistry at Buffalo, has severed his connection with the college and will devote his whole time to the details of his large and lucrative practice. He will be succeeded by Prof. Cyrus A. Allen, formerly professor of prosthetic dentistry. The change will prove most congenial to Prof. Allen, who will in turn be succeeded by Prof. Geo. B. Snow.

DISTINGUISHED DEAD.

The London journals bring us the news of the death of Sir John Tomes, on the 29th of July. in his eighty-first year. There are few practitioners, and possibly few students, in America, who are not as familiar with the name of Tomes as with that of Chapin A. Harris. Both were eminently alive to the highest interests of the profession, both having served their generation in the political arena of dentistry, in its educational and journalistic associations, and in the progress of its science and art. His text books. which have been enriched by the hereditary ability of Mr. Charles Tomes, must continue classic; his researches in dental histology, upon the development and structure of bone, and the broad collateral knowledge he brought to bear upon various scientific problems, led the way in the investigations which have become so active wherever the science of dentistry is taught. It may be said that it was he who devised the proper adaptation of forceps to each particular tooth, doing away largely with the rude key of Garengsot, the pellican, and other such barbarous instruments, now only found among the curiosities of our museums. As early as 1843—three years after he began practice—he was on a committee which was organized to present the claims of the dentists to Parliament, which in 1862 had resulted in the affiliation of dentistry to the College of Surgeons, the organization of various societies, etc. At that period, however, there had been no compulsory education or registration. Every man was a law unto himself, none daring to dictate to the veriest quack who chose to declare himself a dentist, or to make the vilest impostor afraid. It was not until 1878 —ten years after the passage of the Act in October—that the Dentists' Act became law. Sir John was the founder of the British Dental Association: the thinker and the worker in the best interests of his profession, and in the protection of the public. The honor of F. R. S., F. R. C. S., were tributes to his scientific researches, and in 1886 he was honored by knighthood in recognition of the eminent services, scientific, social and political, which he had rendered to his profession, and which brought about, chiefly through his untiring and unselfish work, the position occupied by dentistry in Britain to-day. The life of Sir John Tomes, if written by his son, or by some one as able and familiar with his career, would be a biographical stimulus to every student, and a literary treasure to every dentist in every land.—*Dominion Dental Journal.*

Dr. Augustus Woodruff Brown died July 5th at Manchester, Vt., aged ninety. He was born in Litchfield, Conn., and was the oldest dentist in America at the time of his death. He practiced in New York city for half a century, retiring with a fortune fifteen years ago.

He was at first associated with Dr. Solyman Brown, his eldest brother, in their office at 13 Park Place, New York, where the first dental society in the world was organized and the first dental journal planned. These were respectively the American Society of Dental Surgeons, of which Dr. Eleazer Parmly was first President, and *The American Journal of Dental Science*, of which Dr. Solyman Brown was first editor.

Dr. Brown at one time had one of the most aristocratic and lucrative practices in New York, and was widely known both socially and professionally.

One of the earliest honorary degrees of the Baltimore college of dental surgery was conferred upon him.

Dr. E. Parmly Brown, son of his brother Solyman, studied with him, and is the only member of the family now in dentistry.

The funeral services were held at Manchester; the interment was in New York City.

Prof. Thomas Henderson Chandler, Dean and Professor of Mechanical Dentistry in the Dental School of Harvard University, died at his residence in St. Stephen street, Boston, Mass., Tuesday morning, August 27th, 1895, at the age of 71 years. The *Transcript* and other Boston papers noticed at great length the death of this distinguished member of the dental profession. Said the former:

In the death of Dr. Chandler, Boston has lost another of her honored sons. Born in the old Chandler homestead at the North End, and the eldest of a family of five brothers, he brought himself by hard and untiring work to a prominent position among the literary and professional men of this city. His early education was obtained in the old Eliot School, from which he was graduated at the head of his class, with the Franklin medal. He next entered the Boston Latin School, under Master Dixwell, graduating four years later as Franklin medallist and class leader. Harvard's doors now stood open to him, and he entered. His college career was as successful as had been his previous scholastic efforts, and he obtained several prizes for excellence in his studies, and graduated as a Phi Beta Kappa man and president of the Hasty Pudding Club. He entered the Harvard Law School, graduating in the class of 1853.

His eyes troubling him, he applied for and obtained the post of usher in the Boston Latin School. In 1858 he began the study of dentistry, and some years later medicine, retaining, however, dentistry as his specialty. On the organization of the Harvard Dental School in 1869, he was offered the post of adjunct professor of mechanical dentistry, and on the resignation of Dr. Keep in 1872, he was appointed professor with the degree of D. M. D., *honoris causa.*

The death of Dr. Hitchcock in 1874 left the school without a dean, and Dr. Chandler was unanimously elected to fill the vacancy. Never until the few months preceding his death did he fail in attending a single meeting of the faculty or miss fulfilling a single duty connected with the office. The students liked him, and his associates respected him, for he was a man of unobtrusive and retiring disposition, often carried to the pitch of diffidence

His literary work consisted chiefly of papers for the different medical and dental journals. Translations of two works on dental caries, one by Leber & Rottenstein, and the other from the French of Magitot, were the chief events of his literary career. In this epoch of push and hurry it can be said of few persons that their work was done slowly, thoroughly and to last. Dr. Chandler's ambition was not to be a shining light, but to use his best judgment, his utmost skill and the greatest care in every task, however trivial, that he undertook. As a husband, father, citizen, Dr. Chandler more than met all that is required of every true man.

BOOKS.

General Surgery and Pathology for Dentists. By Edmund W. Roughton, M. D., F. R. C. S. Illustrated. London: J. P. Segg & Co; Philadelphia: S. S. White Company. Pp. 134. As its title clearly states, this little work is general in its scope, the special surgery of the month being reserved for a future issue. The teachings of this, however, are essential to a thorough understanding of the special phase of surgery to be treated of in the forthcoming brochure. It gives in the clearest possible form the meanings of pathological and surgical terms, and points or emphasizes them where necessary by numerous simple and exceptionally effective diagrams. Inflammation is discussed briefly, yet with great conciseness, also its results. The bacteria in their relation to disease get brief mention. Wounds, surgical fever, shock, hemorrhage, fractures, syphilis, tuberculosis, tumours, cysts, diseases of the arteries, veins, nerves, lymphatics and bones, receive consideration commensurate with their importance and as fully as the size of the volume will permit. Good paper and clear type are features of the book.

Useful Hints for the Busy Dentist. By Wm. H. Steele, D. D. S. Philadelphia: Wilmington Dental M'f'g Co. Pp. 298. This is Dr. Steele's second highly successful attempt to present to the busy, practical man, the latest and best methods of skilled operators, and sayings of best writers, all arranged with due regard for their ready accessability. This volume compasses more original matter than its predecessors and is greatly increased in value by numerous illustrations. It will surprise even our most careful journal readers who run through this volume to find how much they have overlooked or otherwise missed in their efforts to keep up with the good things of professional periodical literature.

World's History and Review of Dentistry. By Herman Helmmalm. D. D. S., Chicago: W. B Conkey Company, Pp. 420. In this volume we have a concise history of dentistry up to date; a complete list of dental societies, living and dead; periodicals that have come and are still with us, and those that have ceased to be; colleges that have been organized, with a list of those of the National association of dental faculties; but over and above all this, the legislative enactments of all countries laying claim to dentistry as an organized body, with brief mention of those in which the dental profession has no official recognition. It is the only work of the kind in existance and should be in the hands of every dentist interested in the legal history and status of his profession, and especially those favored with the framing and amending of laws for the right control of dentistry and its relation to other professions and the general public. The amount of labor involved in the production of a work of this kind is simply enormous, and the author in question has placed his numerous readers and the dental profession at large under lasting obligation. The get-up of the book is excellent, therefore in keeping with its contents.

MOVABLE BRIDGES AS USED IN EUROPE. Report of Geo. W. Rafter, C. E., to State (N. Y.) Engineer and Surveyor. Beautifully illustrated by means of photo-engravings. Contains also plans of types of bridges found most useful in the more important cities of England, France, Holland, etc. While of little or no practical value to the bridge builders of the dental profession, it may suggest much of interest to its members who happen to be in authority in cities and towns on the line of our internal waterways. Whether the bridge shall be fixed, or swung, or lifted, in one section or two, is a question to be decided with reference to the special location and the needs of those likely to use it. As an illustration of the cost to those who have to wait now and then at one of the city bridges of the Erie canal, the author makes the loss foot up to $13,500 during the season of navigation, and that on a basis of $2.00 per day as an average wage.

DR. CROUSE'S METHOD OF DOING IT.

When the pulp has been dead some time and the tooth needs sterilizing, I use what I think is called Black's 1, 2, 3 compound, composed of one part carbolic acid, two parts oil of cinnamon, and three parts oil of wintergreen. Oil of cinnamon will sterilize a tooth quickly, but should not be used for the front teeth, as it frequently turns them yellow. For teeth in the front of the mouth I use bichloride of mercury, or carbolic acid, or both; the bichloride first, and then the acid. After applying arsenic I generally remove the pulp in two or three days. This can be readily done by wrapping a little cotton around a small, smooth broach, forcing it into the canal, and twisting the broach slowly, when the pulp will usually cling to the cotton, and thus be removed entire. After this I fill immediately, using the above-named medicine before putting in the oxychloride of zinc filling.

THE

ODONTOGRAPHIC JOURNAL

VOL. XVI. *January*, 1896. NO. 4.

FRACTURES OF THE JAW.

The subject of fractures of the jaw is of exceptional interest to dentists, not only because a broken jaw is one of the gravest conditions that we are called upon to treat, but also since such cases fall within the province of dentist and surgeon alike, and the dentist's aid is often requisitioned for the necessary mechanical treatment.

This injury, being usually the result of a degree of violence quite beyond the ordinary wear and tear of every-day existence, is met with mostly among the lower classes, who are either exposed to such accidents from their work, or run occasional risks in a Saturday night brawl.

Fractures of the upper jaw being of the greater rarity, it will be convenient first to consider those of the lower jaw.

The lower jaw is formed at an early period of life. It is in fact the second bone to be laid down. The greater part is formed from the fibrous tissue investing Meckel's cartilage, but a portion near the symphysis, and also the condyle and part of the ramus, are developed from cartilage. At birth the bone consists of two halves, united by a fibrous symphysis, in which ossification goes on during the first year.

Observations on the development are usually difficult, owing to the early deposition of the nuclei (sixth to eighth week). My object in alluding to these facts is mainly to point out that, owing to its early date of formation, the question of the seat of fracture is not complicated by them.

The lower jaw is at once seen to consist of the body, rami and coronoid and condyloid processes. It is a bone of very strong appearance. When one looks at the whole skeleton, the arch of the lower jaw does not by any means give one the impression of fragility. The coronoid and condyloid processes, however, especially the former, strike one as being a much more likely place for the occurrence of a fracture than the body.

But the protection by muscles of these processes, and their position in the jaw, make such an event one that is rarely seen.

In the young the body of the lower jaw is, with the exception of the petrosal, the densest bone in the skeleton ; but in old age it becomes exceedingly porous, and often so soft that it may break easily

There are many places in which the bone may be fractured. The most common situation is the body of the bone, in the neighborhood of the canine fossa.

We may also have fractures through the symphysis, just behind the wisdom tooth, at the angle, and of the condyle and coronoid processes.

Fractures of the jaw may be either simple or compound.

A *simple* fracture occurs when the ascending ramus is broken.

A *compound* fracture is always the result of a break in the horizontal ramus ; so that all fractions are compound which occur in front of the wisdom tooth.

The reason for this is obvious : whenever a fracture injures the alveolar border the mucous membrane of the gum must be torn, thus rendering the fracture compound. The direction of the fracture is generally oblique, but at the symphysis it is sometimes vertical. Horizontal fractures may be met with when the alveolus alone is involved. Comminuted fractures may likewise happen, and Poland records a case where a fracture occurred in five different positions, the case being a kick from a horse.

The injuries producing fractures are :

(1) Kicks from horses. (2) Blows from the fist or boot, etc. (3) Falls from a heighth. (4) Gunshot wounds. (5) Use of Dentist's Key. (6) Passage of vehicle over jaw. (7) And lastly, Gross mentions a case where an old man fractured his jaw whilst coughing.

When a vehicle passes over a jaw, generally the ramus is injured ; but there is not such a great displacement as one would think owing to the deep situation of the bone, and because it was supported on each side by the masseter and internal pterygoid muscles.

Gunshot wounds generally cause great displacement, and as a rule, not only the lower, but a considerable portion of the upper jaw is severely injured.

Falls from a height fracture the neck of the condyle. In all cases of this accident this has been the cause.

Kicks from horses, and blows, etc., may injure any part of the bone, and so no definite place can be mentioned.

The most common place for a fracture is undoubtedly the body of the lower jaw, Hamilton recording 52 cases out of 55 in which the body was implicated ; and, from statistics, the fracture generally occurs in the region of the canine tooth. This is probably due to the great length of the socket of the canine tooth, and so, consequently, the bone in that situation is not so strong as in other parts. At or very near the mental foramen is the next most common situation. Heath mentions that in 32 cases of fracture 20 were either at, or in very close approximation to, this foramen. Fracture at the symphysis occurs mostly in children, but cases are recorded where men of 60 years of age have fractured this part. The ramus is not nearly so liable to be fractured, owing to its position and muscles, which protect it. There are very few cases known of fracture of this part. The condyle and coronoid processes are rarely fractured alone. When a fracture occurs in this situation another fracture will usually be found at some other part of the bone, so making matters more complicated.

The symptoms are generally the same in most cases, and are well marked. The patient comes with his or her hand holding the jaw, complaining of pain ; but sometimes cannot speak at all, this inability being a typical sign. There is unevenness along the base of the jaw, and irregularity of the teeth, with mobility and crepitus when the parts are handled. The crepitus can be felt by gently moving the fragments together. The patient is conscious of pain and of slight grating on pressing the jaw, and often can scarcely open his mouth. There is a tendency to increased salivation, and this often has a bloody tinge when the mucous membrane has been torn in the case of a compound fracture.

The irregularity of the teeth is best seen by the bite, which is of course abnormal. The teeth sometimes are a guide to a fracture, as usually they are either loosened or broken off, and it often happens that the fracture occurs in this spot. When a fracture of the processes has occurred, it is not easily diagnosed, as the patient does not complain of a great amount of pain ; and it is only by very careful investigation that one discovers where the fracture has occurred. In simple fractures, the smaller fragment is liable to be displaced by muscular action, as it is drawn outwards and a little forwards, so as to overlap the larger fragment. This is accounted for by the action of the temporal and masseter muscles, especially the latter. In double fractures, the displacement is greater since the muscles below the chin tend to draw the central loose piece downwards and backwards towards the Hyoid bone. When the neck of the condyle is broken, that process is often much displaced by the action of the external pterygoid muscles. This accident is distinguished from a one-sided dislocation by the jaw being displaced to the same side. In dislocations the jaw is displaced to the opposite side.

Complications.—Unfortunately there are a great number of complications arising from fractures of the jaw, and often, just as you think that your patient is making a good and quick recovery, one of these complications arises, and delays the case considerably.

(1.) *Wounds of the face* only occur when the fracture is compound. Of course they must be dressed and kept clean, or else their healing will take considerable time, and might lead to disfigurement.

(2.) *Hæmorrhage*, both primary and secondary, has occurred, and been of serious consequence; but as a rule it is very slight, often only occurring from laceration of the gums. Owing to the elasticity of the inferior dental artery, this is not often injured, and so hæmorrhage of a serious kind is very rarely heard of.

(3.) *Dislocation or fracture of the teeth* is not unfrequently met with, owing to the violence of the injury required to produce a broken jaw. Great care must be taken to see that the teeth do not fall between the edges of the bone. Erichsen mentions a case where this happened, and so union was delayed. Teeth very often are loosened. They should not be removed, as sometimes they are a support to the splint, and also will probably become firm and useful.

(4.) *Injury to the base of the skull* has occurred. This has nerves, especially the inferior dental. As a general rule, no injury to the nerves occurs, and Boyer explains this by the fact that "the greater part of these fractures take place between the symphysis and the mental foramen, by which the nerves find their exit."

(6.) *Abscess and Necrosis.* As the fractures are compound into the mouth, it is most difficult to keep the seat of fracture free from septic infection, and the consequence of this is a certain amount of suppuration goes on. Generally the suppuration happens at the seat of fracture, the pus escaping into the mouth. The suppuration may spread to the alveolar portion, and so cause necrosis of a part of the alveolus; but sometimes the pus will accumulate, forming abscesses of different sizes, which usually point below the jaw. Owing to this portions of the lower jaw may become necrosed. I believe, in the treatment of necrosis, that any efforts to assist nature are usually harmful. The blood supply of the bone is so good that the sequestrum will almost invariably come away of itself without difficulty.

(7.) *Dislocation.* This is a very rare occurrence. Only a very few cases are on record of fracture complicated by dislocation of the condyle from the glenoid cavity. The fracture having occurred would tend to prevent the dislocation, as the leverage would be interfered with.

(8) *Salivary fistula* may arise from a compound fracture, or, in the case of a simple fracture, in which an abscess occurs and bursts externally.

(9.) *Irregular union.* When the fracture has been much displaced it may be difficult to get it into its proper position, and so there may be an irregular union of the bone, which may be inconvenient in after life. This does not occur so much in single, as in double fractures ; for the central portion of the jaw is greatly displaced by the action of the muscles. It can be remedied by sawing through the bone at the seat of malformation, and resetting the fragment in its proper position.

(10.) *Ununited fractures.* Fractures of the lower jaw unite with great rapidity, although one may have so many difficulties to contend with. In fact, no bone in the body is so unliable to false joint as the lower jaw, as shown by Morris, who records out of 150 cases—

48	occurred	in	the	femur.
48	"	"	"	humerus.
33	"	"	"	leg.
19	"	"	"	forearm.
2	"	"	"	lower jaw.

Non-union is met with as a result of careless treatment. But a case is on record of a man whose fracture united although he refused to be treated. In this connection Bryant mentions the case of a child, who did not make any recovery until the bandage was removed.

(11.) *False joints.* When bony union between the fragments of a broken bone has failed to take place, the fragments may be united by fibrous tissue in two ways : either by the fractured ends being held together by ligamentous tissue, or a ligamentous capsule is formed, and is lined by a smooth membrane, which secretes synovia. When false joints occur, these are often of great inconvenience, especially in the body of the bone, as the patient cannot masticate properly.

TREATMENT.

Various splints are used for maintaing the fragments in position, and providing immobility. The simplest is a guttapercha splint, which is held in position by a four-tailed bandage. The gutta-percha must be slightly heated and moulded to the jaw, and should be lined with chamois leather, with holes in it to allow of evaporation ; and the parts are best dusted with some dusting powder, to prevent decomposition. This must be seen regularly, as the bandage slips, and the splint often requires readjustment. This splint is most useful when there is no displacement, when the fracture is about the angle of the jaw, and also in horizontal fractures. In most cases interdental splints are required. Of these there are four kinds, which are generally requisitioned : (1) The Hammond or Wire splint. (2) Hayward or Kingsley splint. (3) Gunning splint. (4) Hern or modified Gunning splint.

TO APPLY A DENTAL SPLINT.

The operator must take a model of the upper and lower jaws. This is usually most painful, and for children it is best to give an anæsthetic. Wax is the best material for taking the impression, as it can be used very soft, failing this stent, but it must not be allowed to harden too much. When the models are cast, the lower one should be sawn in two at the seat of fracture, and the two parts held together in their normal position, so as to make a correct bite with the upper.

HAMMOND SPLINT.

This splint is made by bending soft iron wire as neatly and accurately as possible to the teeth, and joining the ends by soft solder. When it is ready to be inserted into the mouth (the fragments of course having been placed in their normal position), it is kept in position by being bound down by binding wire in the following way : the wire must be passed from *without over* the *top of the outer bar* and brought out *under the outer one* and the ends twisted together under the bar.

The ligaturing of the teeth is most difficult, and Mr. Newland Pedley has invented two pairs of forceps for passing the wire and holding it. Not only do these save a lot of trouble, but also prevent traumatic inoculation from the fingers being pricked by the binding wire.

Before applying the splint, it is necessary to remove all the tartar around the teeth and to get the teeth as clean as possible.

The great advantage of the Hammond splint is, the patient need not wear a bandage, which is always most cumbersome, and he can masticate his food, and keep his mouth clean by the use of various mouth washes. A mouth wash must always be given, and is to be used as frequently as possible. Condy's fluid is perhaps one of the best, as it is cheap and efficient. If astringents are likewise required, sulphate of zinc may be recommended. The Hammond splint is suitable when a fracture occurs in a mouth having firm teeth, and in severe cases of horizontal fracture involving the alveolus of two or three teeth.

It should not be used, however, in a downward displacement.

The next splint of importance is the Hayward or Kingsley.

This is a vulcanite cap, fitting over the teeth very loosely, and into each half an iron wire is inserted, so that they lie outside the mouth. They should not be too thick (about ⅛ of an inch), and reach as far as the angles of the jaw. Two points or tags are soldered on to the wire, one near the front to prevent the bandage slipping forward, and one at the back for fixing the bandage where pressure is required about the angle. Into the cap some softened guttapercha must be moulded, and when the displacement has been reduced, the splint should be forced into position. A pad is placed under the chin, and a bandage fixes them all together.

This form of splint is usually used for children, when the teeth are not firm enough to permit of a Hammond, or in a downward displacement, or where there are few teeth standing.

The great objection to it arises from the fact that the wires do not allow of the patient sleeping on his side ; but on the back.

GUNNING SPLINT.

This splint, which is but rarely used, is made by vulcanite caps, joined together for the upper and lower jaw. A space is left in front, so that the patient can receive his food through it. These caps should be filled with guttapercha, and a tight bandage should be applied.

There are very few cases in which this splint can be used, as it is so cumbersome ; but is is usually applied when there is a fracture of the upper and lower jaw together.

HERN SPLINT.

This splint is a modified form of the Gunning, and was devised by a late member of our staff. It consists of a vulcanite cap covering the teeth and alveolar border of the lower jaw, blocks or pillars being made for the articulation of the upper teeth, in which guttapercha is inserted.

This splint is put in in the usual way, but Mr. Hern prefers a skull and chin cap to a bandage.

The advantages claimed by Mr. Hern for this splint are :

(1.) The upper teeth are not covered over, so that the patient can cleanse his mouth and keep the teeth clean. (2.) It can be adjusted quite easily. (3.) It is not very heavy. (4.) It can be made to articulate with the upper teeth by means of guttapercha.

The most suitable cases to use this splint are :

(1.) In edentulous cases. (2.) Where there is a fracture behind the last molar, or ramus of the jaw. (3.) Where there are no firm teeth in any fragment.

There are very many more splints one might describe ; but I do not intend to enter into detail with them, but will name them briefly :

(1.) Wedges of cork sloping to a point and four-tailed bandage. (2.) Wedges of guttapercha introduced warm into the mouth, so as to become moulded to the teeth and gums, as advised by Hamilton. (3.) Mutter's clamp. (4.) The very ingenious but rarely practical method of Dr. Angle. (5.) Lonsdale's splint, suitable for fractures between the incisors. (6.) Wiring of the bony fragments. (7.) Ligaturing the teeth with silk, which is not satisfactory, as often the teeth are loosened, and irritation is set up in the gums. (8) Thomas' splint, for compound fracture, by drilling the bone on either side of the fracture, and fixing the fragments by means of a thick pliant silver wire.

There are many disadvantages to the use of splints, and, briefly, these are :

(1.) The dribbling away of saliva. (2.) Great weariness from propping open the jaws. (3.) Owing to the difficulty of keeping the mouth and splint clean. (4.) Closure of the mouth, leading to suspension of speech and mastication.

CASE OF FRACTURE OF THE UPPER MAXILLA.

Fractures of the upper maxilla are so rare that I have only one case to show, kindly lent me by Mr. Storer Bennett.

The patient, a man of 23, had a very severe fracture, caused by the explosion of a chemical engine. There was very great displacement, and the antrum was severely injured.

A vulcanite plate was used, and wired to the teeth.

The patient wore it for six months or so ; the fracture united satisfactorily, and, as will be seen from the model, the displacement was almost rectified.

Time has not permitted me to amplify many of the details of great interest to which allusion has been made, but if in this somewhat cursory view of the subject I have raised points which will excite a good discussion, my object has been attained.—FORSYTH (M. F.), *Dental Record.*

THE SUREST TREATMENT TO SECURE ROOT-CANAL STERILIZATION—ANOTHER INSTALLMENT.

Dr. Truman.—I suspect the best reply to make to this would be, I don't know. The means for effecting sterilization in anything are as yet in their infancy, and any dogmatic statement that this or that method will effect it must be taken with a large allowance for error.

The question is not free from ambiguity. It is difficult to know whether sterilization is meant to include the time just previous to filling, or to prevent the remote and very possible element of danger that may arise subsequent to the filling. It is assumed that it is intended to apply to the first-named condition, and upon this understanding it will be considered very briefly.

As the main canal is alone in question, it is very plain that we are left to the agents that effectually inhibit pathogenic germs. I do not use the word destroy here, for I have no positive proof that germs can be absolutely destroyed upon a vital tissue and it retain its vitality. The antiseptics in use in dentistry are limited, but in my opinion no reliance should be placed upon a single one of these, but the treatment should be by a continuation of agents and methods. The importance of sterilization to the fullest extent possible cannot be overstated.

To intelligently consider this question, the condition of the root should be taken into consideration. All canals are not equally charged with decomposed matted ; but, as this is an uncertain quantity, they should be given the full benefit of the existing doubt and treated exactly alike. This involves, first, thorough cleansing of the canal ; second, equal thoroughness in making it aseptic.

The agents used may be briefly stated to be,—

1. Those that act on organic matter,—hydrogen dioxide or pyrozone ; or the alkalies, as sodium peroxide ; or a combination of the escharotics and alkali, as the process recommended by Dr. Callahan of sulphuric acid and bicarbonate of soda. These are practically cleansers, while in a degree they are antiseptic.

2. Follow with one of the following antiseptics proper: mercuric chloride, hydronaphthol, thymol, creolin. The latter I regard as one of the best antiseptic cleansers we have. Used in full strength with cotton to wipe out the canal, it is most effective. When this has been carefully done, the canal should be dried by the warm-air blast. This, in my judgment, is the proper treatment of the canal, and will place it in the best possible condition for subsequent filling, if the minute microscopical cells are not to be considered. If these are regarded of vital importance, as unquestionably they are,

then the filling as recommended in answer to question first, oxychloride of zinc, must, in my opinion, be adopted, as I place no reliance in the lasting effect of the essential oils.

Dr. Taft—The treatment of any pulpless canal should and ought to be regulated by the conditions that may be present. A canal from which a healthy or comparatively healthy pulp has been removed, when cleansed, is in the best condition for fiilling. No sterilizing nor antiseptic treatment is indicated if the tooth has been protected against moisture and the entrance of foreign substance. Medication of such canal is likely to be attended with more injury than benefit.

The question of coagulating treatment to act upon the contents of the tubuli has excited some discussion. The introduction of coagulation into a thoroughly cleansed and prepared canal will not, perhaps, in any case be the occasion of injury. The extent, however, to which it may be operative, will depend upon the character of the agent and upon the condition of the structure to which it is applied. Greater penetration will be effected in some teeth than in others. It is a question not yet decided as to whether such coagulation accomplishes any benefit or not

Canals in which pulps have been destroyed by disease are presented in very different conditions. In some the remnants of desiccated pulp remain, while in others the entire structure of the pulp is broken down and the canal filled with pus or sanies. With a desiccated exudate through the canal, simply cleanse by manipulation and wash with warm water or some simple dilution ; then, after drying the canal, some antiseptic agent may be employed.

Sulphuric acid treatment, brought prominently to the notice of the profession within the last two years by Dr. J. R. Callahan, is in very many cases of pulpless canals an excellent treatment. By its introduction it facilitates the removal of all *debris.* It also acts upon the walls of the canal, dissolving from the surface more or less according to the strength and amount of the acid used, thus enlarging the canal instead of with an instrument. After the employment of this mode of treatment no further sterilizing agents need be used. Every organism reached by the acid would be effectually destroyed.

In all favorable conditions canals should be filled immediately after their thorough cleansing and proper forming. In the less favorable cases expectant or test treatment in the way of thorough closure with some easily removable substance, such as gutta-percha or Hill's stopping, may be employed, this remaining for a few days to a few weeks according to the more or less favorable conditions that are apparent.

Dr. Andrews.—I do not know the surest method of canal sterilization. My method, though very simple, works well: clean thoroughly, use five-per-cent. pyrozone, dry thoroughly, and then fill, having all instruments surgically clean.

Dr. Foster.—Bichloride of mercury, or cyanide of mercury, or chloride of zinc.

Dr. Hart.—I do not think that Schreier's preparation of sodium and potassium will ever become popular in general practice. We may use it now and then, but it is a preparation that takes longer to apply in any canals than the medicaments that we usually employ. I see that one gentleman recommends leaving it in the canal and sealing it up. I can scarcely understand what advantage would ensue, because it acts so quickly that immediately upon its being placed in any canal where there is moisture the effect is obtained; the bubbling of Schrier's preparation is immediate, and I think there is a distinct disadvantage in leaving it there after the effervescence has taken place. One might summarize what we have heard to-night and come to the conclusion that cleanliness is the principal thing. We have heard praised nearly every therapeutic agent that we use to obtain asepsis in a root-canal, and no doubt each one is successful after the proper cleanliness has been obtained. In my own practice, after using bichloride of mercury, 1 to 3000, for some time, I went back to the old standard, carbolic acid, and have used that ever since. It may have been from the method I used, from pumping too hard in the canal, but I do not think that was it, because I used the same care that I do with the carbolic. I do not dread the coagulating influence of the carbolic acid. Whether it is that the subsequent asepsis is induced by the osmotic action or not I cannot say, but I have had least trouble with the carbolic acid.

Dr. Merriam.—Dr. Whitton, of Boston, whose early death is, I believe, the greatest loss that Boston has had in my day, gave this subject a great deal of attention. One part of his practice that I have not heard mentioned in connection with the subject to-night was always to remove by a rotary motion. An evil that exists in the schools is the probing by students; the desire of the student to see how far he can get when he first opens the tooth, perhaps to satisfy himself or to excite the admiration of the patient, is natural, but the passing of an instrument through a putrid mass is certainly a most dangerous thing. Dr. Whitton's method was to wind cotton carefully on small broaches, having as many as needed ready for each case. He removed carefully from the pulp-chamber, and as fast as the cotton on the broach became soiled he took a fresh one, and spent all the time necessary at the first operation in cleaning the root. He filled a great many of his cases immediately, and, as nearly always follows, I think with any one who adopts a system and gains the confidence of the patient, he had very excellent results. One thing about the peroxide which we mentioned to-night, I think we overestimated it and its effects on the tissues. We should think of it as a detergent, and to the extent that it is a detergent it is of benefit ; but it has no effect upon the tissues themselves. At Billings & Clapp's, Boston, who make the best peroxide I have used, they were kind enough to tell me that it was best to buy it from the nearest manufacturer. I have followed that hint since, going right to the factory and getting what I need. We are all very much better off than formerly in the instruments that we have. The music wire that has come to our assistance allows us to make instruments and to use them with better security than anything we had before.

Dr. Hodson.—I am fully pursuaded that perfect cleanliness is our sheet-anchor in the premises, and the most perfect elimination of all septic material the very first necessity ; the methods are individual. My own plan is never to touch putrescent contents of the canals on first opening to them, but apply full disinfection under a cotton and wax dressing for twenty-four hours, and even then am specially careful, after very gentle use of the bare broach for the mass, not to push anything (even air, which in the circumstances would be poisoned air) through the ends of the canals, which I am persuaded any swabbing out process will surely do, but I alternately fill the canals with warm water by syringing, and then draw it loaded with putrid material down and out by capillary attraction through the insertion of the paper points, which I presented to you twenty years ago (and which, by the way, another man has applied a little extra stiffening material to and boldly advertises the whole as his own). This is a *pulling process* entirely, and I cannot but feel it to be, to me at least, of real value in the premises. This principle of capillary attraction I employ in many directions in my general work, and find it of real value.

Dr. Sailer.—One point of our discussion which has not been developed very largely, and at which I have been somewhat surprised, is the nerve instrument. Dr. Guilford alluded to the drill, but I would rather call it the nerve-canal drill. I think Dr. Guilford has struck about as clear a way of sterilizing a root as we can possibly get at. If you cut away the dead matter you certainly sterilize it. You can then use the cleansing medicament, and cleanse out what is left. I always follow the process of using a canal-drill and taking out the dead matter and enlarging the canal as far as I can, then, as we heard to-night, avoid carrying the dead matter through. You can always avoid that by using a hook instrument made by Donaldson, using a large one first, and reducing it gradually until you can just get to the end of some of the roots—not all, of course. You will not have much trouble if you do that. I want to call attention particularly to the nerve-drills. To my mind, those are the most important instruments in sterilizing the canal. I have very frequently drawn out a putrid nerve by the use of a small nerve-drill. In doing that, you want to use a drill that is very much smaller than the nerve itself I do not mean this for anterior roots of lower molars or some of the inferior teeth, nor for the buccal roots of superior molars.

Dr. Brockway.—The first step in the sterilization of a root-canal is to get as free access to it as possible, cutting away at the *outset* all that you intend to. For the removal of the contents of the canal, I make much use of the Morey or Gates-Gliddon root-drill, while using them having my assistant at the same time pump into the canal from a syringe water as hot as can be borne ; this washes out the *débris* and does much towards cleansing the root.

I know that some of my brethren condemn the use of the root-drills as needless and dangerous, but I find them most efficient if used with skill and judgment, always taking the largest sizes first to avoid breaking. For the sterilization of the canal I make use of the various disinfectants, bichloride of mercury, peroxide of hydrogen, peroxide of sodium, etc., as seems to be indicated. For the past two years I have made much use of Schreier's preparation of kalium-natrium, and with great satisfaction. Where the canal is filled with exceedingly putrid matter I often apply it before making any attempt at removal. This renders the operation much less disagreeable. My experience with this preparation has been that it is one of the most efficient and expeditious that we have, its action as you know being almost instantaneous.

Having the canal clean and sterilized, I think it makes not much difference what antiseptic is used for further treatment ; there are many good ones in common use. I rely mostly upon oil of cinnamon in conjunction with the root-dressing devised, I think, by Dr. Lord.

I omitted to mention the use I make of the Evans root-drier in the sterilization of root-canals. It is exceedingly valuable in this respect. I think no one has spoken of it except Dr. Jarvie, but it should be in general use. Through its flexible silver point one can safely heat the canal so as to destroy any germs that may be present.

I have made use of the method spoken of by Dr. Jarvie in some thirty or forty cases, and so far am much pleased with the results.

Dr. Hill.—It is rather pleasant to hear our most eminent men agree very nearly in the treatment that most of us use, and it shows that we have brought down the treatment of pulpless teeth in various forms pretty nearly to one that we all use. I would like to tell my experience with drills, but I have not used them. Where I did not want them they were very useful, but where I really wanted a drill, and ought to have had one, I could not have made use of it, for I never could find a straight one that would bend and go around a corner. I do not want to be misunderstood. I have not in twenty years been without sulphuric acid, and I do not think I have ever treated an abscessed tooth without sulphuric acid, 20 to 50. Dr. Callahan's idea is a different method. I have never tried it. After treating diseased roots of teeth where there have been abscesses, there is always trouble in such cases, and you want to get to the end of the root. I clean out a root with five or six fibres of cotton on a broach, allowing the cotton to extend one-half to three-quarters of an inch onto the broach; then I turn it right around the broach until I have a perfect screw made of cotton. Make it small or large, but work onto the end of the root until you have it very small, and you can get every particle of foreign matter out of the root. Take an abscessed tooth, and if the root is decayed put a forty per cent. solution of sulphuric acid there, and the odor is something awful. You can clean it out with soda or warm water as you choose. Where there is an abscess on the root I always pump that through. If the processes are diseased at all, it will hasten the death or dissolve what is there. I have used sulphuric acid in that form ever since Atkinson first introduced it. I have tried to find the date when it was first introduced, and I think it was by Lister in the London *Lancet* some time in the seventies. When Callahan's treatment came out I was surprised that more dentists did not use that method. There is nothing that will clean out a root so nicely or thoroughly as that. I am one of those who never fill a diseased root at the first or second sitting. At one time I used peroxide of sodium to have it work out through the dental tubuli.

Dr. Merriam.—I have been lately experimenting in rather a large way to see what we could do in the improvement of instruments by beginning at headquarters. I wrote to one of the large steel firms in regard to music wire, and had them make for me that wire in octogon forms. It is of such temper that it can be readily filed and flattened without changing the temper in any way. I brought some of this steel with me to New York and left it at Schmidt's. They made a few instruments for me this afternoon, and if you will accept them as a report of progress I should like to show them to you. I would speak also of the milliner's needle. It is very long and narrow and the tapering is very slight. The temper can be drawn as stated by Dr. Perry, and, fitted into a round handle, it makes a nice instrument for exploring. They can be obtained in very small sizes indeed. The steel wire I spoke of can be made into the various forms that a dentist wishes. One of the ideas I had was that the small octogon would do away with the present strain ; the force used is often too much for the point.

Dr. Turner.—I think it would be well to call attention to a method of filling root-canals recently introduced by Dr. Van Woert. It consists of filling them with paraffine and iodoform. Dr. Jarvie spoke of Dr. Van Woert's method of treating the canals with the Evans root dryer. After the canal is dry some of the paraffine is introduced into the cavity around the copper wire that extends into the nerve canal, and the heat from the Evans root dryer melts this immediately, and by capillary attraction this runs into the root-canal and fills it absolutely. The wire is withdrawn while hot, and the paraffine remains in the canal.

Dr. Hill.—Of course, everything that Dr. Perry reads is almost perfect. I am delighted with the paper, and I am not at all surprised at its being so perfect coming from him ; but I wonder why Dr. Perry made such a preparation of handles on the broaches. Swiss broaches come from the size of a hair, and run from about two and a quarter inches up to five inches long. I have never used anything else. I never had a Donaldson broach or any of the others in my office. Up to a very few years ago I barbed all my own broaches. Take an instrument two and a half inches long, say nearly an inch of it being handle, and for all purposes of putting on cotton and rotating it, it is far preferable to having an extra handle on it. If I understand the broaches as I see them there, you can just as well have the long ones. I find fault with Dr. Perry's way of drawing the temper. He puts the instrument in a glass tube and draws the temper equally. I think that is a mistake. You light your little lamp, hold that just above the guard which is on it, commencing just at the end of the broach, anneal it just enough to get the blue, and you can draw the temper of the broach perfectly, having the broach stiff near its handle, and at the sharp end you can have it perfectly pliable. I have nothing whatever to say in regard to filling roots. We all do about the same thing. Nearly all of us use chloride of zinc in some way. We may have different ways of applying it. In filling the roots Dr. Perry has the gold wire, which is undoubtedly a good thing. Just as good a thing, or better, is to wind a foil on a fine broach, then pull your foil a quarter of an inch beyond the end of the broach and roll it in your fingers, and you will get as fine a point as possible. For all incisor teeth it is a very good way of filling. There is nothing better for a single-rooted tooth than gold ; in that way it can be done very readily. I must congratulate the Society upon getting these various opinions together in the form they have. It is very valuable. I do not think it has ever been done before in any society. This ought to be somewhat conclusive in regard to the matter of sterilizing the roots of teeth and filling them.

Dr. Perry.—Dr. Maynard had a strong preference for wood handles on all his delicate instruments. He claimed he could have more delicacy of touch with a wood handle than he could without it. It may be that unconsciously I have imbibed a little of his feeling, and for many years I have had my instruments made with the handles of a light kind of wood. I was aware that there were broaches made with longer handles than these. I use many of them without the handles, of course. I do not use them with the wood handles in all cases. There are many operations far back in the mouth where you often need a little handle on the instrument. There is nothing original claimed in reference to those broaches or their use, and as for filling the canals with gold on the end of the broach, you have all done that I suppose. I abandoned that many years ago for several reasons, because it takes a great deal of time, and after it is all through you have a filling that you cannot get out, and it is not an antiseptic material. It may happen that you may never want to take it out, but perhaps you might want to do so, and then there would be trouble. I will defy anybody to fill these little roots with more success than can be done with these wires. That is a great deal for me to say, but I feel sure that I get that little point of gold right down to the very end. I carry with it just enough sterilizing matter to fill up the space and check the trouble at its very seat. You must have some substance to carry before the instrument to get it tight. I know it is perfectly practicable with these little points of gold, for they are prepared in a moment. You can have them on hand, pick them up, moisten them with chloro-percha, and it is done in an instant. I do not care what you use, whether it is chloro-percha or oxychloride of zinc, or this preparation of Dr. Van Woert, which Dr. Lord has used so long, but you are very liable to forget that in those closed ends you get the air in, and think you have filled them and you have not.

Dr. Hodson.—I was just about to speak of that particle of air. I am accustomed to using chloro-percha with the gutta-percha points following, and employ the same capillary principle of which I previously spoke, by first filling the canal with clear chloroform, or with so little gutta-percha in it as to be as limpid as the clear chloroform, and then placing a very tiny, smooth broach wet with it in the nerve-canal and reaching to its end, being sure, of course, that an opening is left along the side of the broach so that capillary attraction can act. I drop the chloro-percha at (not over) the entrance of the canal, and the capillary attraction, acting both over the wet broach and the wet canal, carries it surely to the end of the root.

I am certain of that by the pumping process proving it. Then I insert the gutta-percha point and carry it gently but quickly to its seat in the canal, as before stated.

Dr. Jarvie.—In the answers from different gentlemen the use of certain waxes is advocated. I think the process described by Dr. Turner is exceedingly valuable. Perhaps further experience may change my mind, but at the present time I think it is the best way we have of filling root-canals. The method is to prepare a piece of copper wire small enough to penetrate the finest root-canals and graduated in size to fit them. Fill the cavity of decay, or put into it a sufficient amount of paraffine mixed with iodoform. Heat the bulb of an Evans root-dryer and let the protruding end of the wire enter the hole in the bulb. The heat is conducted to the extreme end of the wire, and the paraffine is melted. Draw out the wire and capillary attraction will draw the paraffine into the space left vacant by the wire. You can see the entire process by experimenting with glass tubes. It is marvellous how the wax will fill up the space previously occupied by the copper wire. You can make the copper wire as fine as the steel wire, but of course when it is very fine it loses heat quickly. You must have the wire according to the size of the root-canals. I think the system of Dr. Perry for the fine canals is very good, indeed, but for the larger ones I think this method of Dr. Van Woert is better.—*International Dental Journal.*

TIDINESS.

I called on a dental friend one afternoon after office hours, to make him a friendly visit, and found him as he usually is, *cheerful*, although at the time his *chair was empty*. After conversing for a time in his den of horrors, I could not help commenting on the neatness of his surroundings and the freedom from all *litter* about his operating chair.

" Have you been working at your chair to-day ? " I enquired, and he answered, " Yes, since half-past eight o'clock this morning."

" Well," said I, " your chair, your rug, your instruments all look more as if you were about to begin, not finish work for the day. How do you do it ? "

He then told me he had *schooled* himself to work in this way.

" I have duplicate excavators and nerve instruments. As soon as I have finished working with these for one patient, my attendant removes them from the bracket table and puts them in the sterilizer.

" All pieces of cotton, bibulous paper, spunk, ends of ligature silk, and sand paper disks, instead of throwing on the floor I put into this little red glass vase which I keep on my bracket table for the purpose.

Mouth napkins, towels, and rubber dam I put into this basket "—indicating a basket with a lid, similar to what is used by fisherman—" which keeps them out of sight, and makes the operating chair and its surroundings as clean and tidy for the patient leaving it as for he one who is to occupy it.

" Besides this I always keep a napkin over my head rest, which I remove in the presence of the new patient, and replace with a clean one, for it is not pleasant for our patients to lay their heads on a napkin which has been used by another patient ; however tidy the former patient may look, there may be a *suspicion* of such contact.

" In long operations, especially on the lower jaw, when the rubber has to be kept in place by a clamp, which makes it almost impossible for the patients to retain the saliva, I have a square of rubber dam—(a yard square)—this I place in front of the patient over the dress, and over this a nice large clean towel.

" When the dam has been applied, I place a small napkin over the patient's chin beneath the dam and hold this in place with two clamps applied—(one on each side) to dam and napkin. In this way the patient is made as comfortable as possible, and the operator can work more comfortably and tidily."

In contrast to this we have seen dentists offices at the close of the day's work a mass of disorder and litter. On the rug next his chair were strewn bits of ligature silk, sand paper disks, wads of cotton, pieces of bibulous paper, bloody napkins and the like. Dirty water would be in his basin, which probably had been used a half dozen times while he waited on that number—(or maybe more) different patients A wet towel lay on the back of a chair. Pieces of dam lay strewn over the carpet, letters and newspapers occupied desk, chairs, sofa or book case, all presenting such a disorderly and untidy appearance, that if a patient could see it who had any notion of order and tidiness, she might deliberate about employing such a dentist, however great might be his qualifications or skill.

It costs no more to be tidv than untidy, once a man gets in the way of working tidily, and it is only necessary for him to adopt a tidy habit and school himself into this way of working by thinking a little when he in is the act of working or doing some untidy trick or habit. Once the habit of working tidily becomes well instilled it becomes a second nature, and the work goes on intuitivly without an effort.—CHUPEIN (F. T.), *Office and Laboratory.*

ASSISTANCE AND ASSISTANTS.

In the old days of negro slavery in a portion of our land it was said that differing characteristics between people of different sections might be described thus: A Southerner never does for himself anything which another can do for him, and he never does alone that about which he may have help. The New Englander never asks another to do for him that which he can do for himself, and he does not have help in doing that which he can do alone. In the old order of things, with people of whom we speak as belonging to the old school, these descriptions were not far from having a good foundation in truth; but time and circumstances have brought changes in the way of doing things to all.

I am myself of New England parentage, the descendant of a stock that had all along been under the necessity of hard work,—harder than we of to-day always realize and remember,—and they brought up their children to work, to work all day, and to work every day, and to work quite after the defined New England fashion. I shall never forget the jealousy which I had when ten years of age of an older boy in the neighborhood who had been hired to help in cutting up the wood-pile which I wished to cut alone.

I got also by heredity, example, and precept other tendencies and other training which included in detail much guidance in regard to the practical affairs of life. I was taught that I should mind my own business; that I should avoid partnership relations; that I should seek to keep my own affairs in my own control, and that I should be cautious about becoming responsible for the doings of others. However poorly I may have learned the excellent lessons put before me, I shall never cease to be grateful to the best of fathers and the best of mothers who gave me the substance of all that there may be in me of good. And what I have said of my own case finds doubtless its counterpart in the experience of nearly every one seated about this table to-night. It is the story of a large part of those who have made their lives a credit to themselves, an honor to their parentage, and a service to the world. The spirit of such training can never become superannuated or shown to be fallacious. Superficially, it may seem not quite in harmony with modern methods ; essentially, all that is good in each is in entire accord with the other.

This congruity I did not at once see. When I came under the necessity of being the manager of my own affairs, I had a little time of seeking to do everything that I could with my own hands. That time I do not regret. On the contrary, I rejoice to have had the experience just as it was. It was most appropriate to the circumstances of the time ; it stimulated my efforts, extended my resources, cultivated my self-reliance ; was often that necessity which becomes the mother of invention, and it made the proper foundation upon which to gradually develop the plan of putting out of my own hands that which might be done equally well by others. Twenty-two years I have been a practitioner of dentistry. In the last twenty years of that time I have had help in my work.

On the title-page or in the preface of almanacs we are accustomed to find a statement to the effect that the calculations which follow are accurate for some particular place, as Boston, and that they may be made to serve for a considerable surrounding territory, as New England. My experience has, of course, been very largely dependent upon circumstances of time and place, and greatly modified by those circumstances. For other circumstances the calculation would need to be varied, or perhaps could not be made to serve at all.

When I located in Newport, there was room for me and work for me to do. The work was begun with certain ideas concerning it. Some of those ideas have been proved erroneous ; others have become in the passing years more and more positive convictions. Newport is s small city ; and it has seemed to me that in at least two prominent particulars dental practice in a small place should differ from that which is permissible, not to say advisable, in a large city. One of these has reference to the subdivision of practice, the making and following of a specialty within the specialty. In the large city the dentist may do no extracting, or he may do nothing except extracting. He may give his whole attention to the general care of children's teeth, to the correction of irregularities, the conservation of adult's natural teeth, the insertion of artificial teeth, crown and bridge-work, or the practice of oral surgery, with the probable consequence that the entire community has its dental needs the better served for his so doing. Again, in the large city where there are many practitioners, the man of experience, of superior abilities, extending reputation, and rapidly growing practice may increase his fees beyond the ordinary, or beyond what they were in his beginning, and this, if properly and honestly done, without injustice to any one. There are inexorable limitations to the amount of work which one man may do in his life, and it is legitimate that the compensation for that work should be influenced somewhat by the same laws of supply and demand which dominate values in the commercial world. The express train would cease to be an express train, or to possess the advantages of an express, if it went at the speed of an accommodation train and stopped at every station. The railroad system which stopped every train at every station would serve but poorly the convenience of its patrons. So in the large city, the dentist upon whom extraordinary demands are made, and who can command extraordinary compensation for his genuinely skilled and superior services, may not be only justified in avowedly making his fees high, but he may find it his duty to do so in order to so limit his work that his physical and mental condition shall be always such that his patients may invariably receive the superior service for which they pay. Further, he may by such course, without making hardship for any not well able to pay for his service, be aiding in justice to his dental neighbor, equally faithful, but younger, less experienced, or less well known.

I am unable to mention this subject of fees without an expression of caution to men, and especially to young men, that they do not put effect in the place of cause, and be hasty and arbitrary in demanding the high fee, thinking more of that than they do of first attaining the superiority of service. There are needed many more accommodation trains than express trains, and we should all seek to avoid mistaking the calling with which we are called. In the small town the plan of indiscriminately raising the fees in order to lessen the volume of practice is not usually a thing to be accomplised without imposing hard conditions upon some dwellers in the community.

While, perhaps, having a smaller proportion of extremely poor people than most places, Newport does present an exceptionally great range in the material means and the advantages which means command, of its population. A proper share of all these classes of people rightfully expect that their needs for dental service shall be met by local practitioners, and they are so met. A moment's thought will show that a practice of such range of demands is more complicated to manage with satisfaction to all concerned than is one more nearly uniform in means, advantages, standing, desires, and ways of doing things. In the complex practice assistance seems to have particular adaptation, and actually independent operative assistance may probably be more readily made helpful than in an exclusively high-class practice.

Except it may be in regions out of the range of the intimate acquaintance of those who are assembled here, the taking of students—that is, entire novices—into offices, with the double object of the principal gaining assistance in his work and the young man being made a dentist, is happily almost entirely a thing of the past. Some of us can almost remember the time when the student of general medicine got his instruction, both theoretical and practical, largely from a private preceptor. Every one of us is cognizant of the fact that even up to the present a similar plan has been followed in the study of the law, but in the law the plan is fast passing out. It is to-day almost forgotten that it ever had place in study of medicine. Such of it as continues in dentistry can advantageously be only to supplement and make more perfect the teaching of the schools. While it is to be maintained that the schools are right in requiring the attendance of their pupils through three full school years, it is to be admitted that there are certain graces that have their acquirement and cultivation greatly favored by a little experience in the atmosphere of a refined private office.

In my own case as a student in an office, and in the single instance of my being a preceptor to a student in my office, the experiences were gratifying and, I believe, thoroughly profitable to all concerned ; but in each case it was understood in advance that with all reasonable celerity the advantages of the school were to be embraced and the degree attained. But in multitudes of cases of students in offices the arrangement has not yielded the most profitable results. The preceptor, through incapacity or inattention, has failed to do his duty in wisely and judiciously superintending and pushing the studies of the learner, while on his part the learner, even with the best desires and intentions, has been incapable of rendering the principal such help as he would have been glad to have. In proportion as the student becomes advanced and experienced, wherever that progress has been made, the profitableness of the office relation increases. The advanced student is more apt to learn from what he sees, and he can render in return more efficient service.

This leads me to say that in every practice whose volume justifies considerable assistance, that assistance may be best rendered by one who has had the teaching and the training evidenced by the possession of the degree. For nineteen years I have had in my office graduate assistance. In succession four different men have occupied the position. With myself, there have been five parties in interest. According to the best of my knowledge and belief, there has been no time when any one of the five would not have testified that the arrangement had been a profitable one for him. By such plan each party gets the best end of the bargain, while the patronage of the office is more promptly and better served. The principal is relieved from demands which he could not possibly meet, and this surplus which attainments and reputation have attracted, instead of being driven away, remains to be acceptably served under the same roof, with his advice whenever needed, and in a way to yield to him some return,—a fair proportion.

The assistant is presumably a recent graduate, one who has his name and fame to make. I believe the young dentist at the time of obtaining his degree is more practically educated—that is, he is better fitted for actually doing his work—than is the young man in most of the other professions and specialties at the time of receiving his degree. Of couse, the young dentist has still much to learn from experience,—I suppose most of us would say as much after graduation as before ; but the principal thing which the young graduate needs is a chance to go to work, the opportunity to show what he can do, to inspire confidence and to become known. This the assistant's position gives him. Being vouched for by one whose recommendation is reliable and influential, his work begins at once, his income begins at once ; and idleness and waiting, the proverbial starvation period, are eliminated. He gets compensation in money, he gets it in constant conference, aid, and counsel from the older and more experienced man, and he gets it in a growing and developing practice for himself which the transfers of his principal and his own faithful competency are all the time building up.

This assistant, of whom I have just made mention, should be, like his principal, an all-around man, capable of doing with his hands everything, operative and mechanical, within the usual range of a mixed dental practice. Particularly should this be the case if the volume of the business of the office is sufficient for the employment of only one assistant; although there are instances most satisfactory in their general working, of the association together of two men, one of whom, from taste, and capacity, gives his attention to the operative department, while the other, for like reasons, attends to the prosthetic branch.

During a large part of the time for the last twelve years I have had regularly a second assistant, whose work has been entirely or almost entirely in the laboratory. The intent is to have the person in the laboratory do the laboratory work. During these dozen years the place has been filled by a succession of different individuals with differing qualifications, but usually with a good degree of competence for the work. Several times the place has been occupied by a young man who had had one or two years in a dental college, and who found it convenient to spend a summer vacation or a longer interval in earning some money, while at the same time adding to his store of knowledge and experience. Two young men were of the kind giving their whole attention to laboratory work. One of these was a young Englishman, who had been regularly through a portion of the long apprenticeship prescribed in his native land, and the other was a young colored man. Each one of these was particularly capable in his work. The young colored man of good abilities of the right sort may find in the dental laboratory full, congenial, and renumerative employment in any community where there is the work to be done; and he may thus make a success in locations where he could hope for little as an operator or as a general practitioner.

To fill the laboratory man's place it is far from necessary that one be a dentist. Though it is well for him to know something of anatomy, physiology, and pathology, he is likely to be more helped in his work by a knowledge of physics, chemistry, metallurgy, and the principles of force and mechanics. One who has served an apprenticeship to the jeweler's trade will usually be found to have special aptness in neatly and ingeniously constructing the varied appliances needed to meet in the best way the requirements for regulation and replacement.

For nine months I have had in my laboratory a young woman, and for six months, with such occasional little assistance as the others of the office force could render, she has done alone my laboratory work, and also, as she had opportunity, some work in the same line for several of my dental neighbors. Quite a large part of her teaching during the first three months was by a proficient young man who had had two years in the Harvard school, and who spent the summer vacation in the laboratory with her. Until she came to the laboratoay she had not had practice in any similar occupation, and, as would be expected, her present capacity for the despatch of the work is not what it will become with more experience. She is most careful, painstaking, and earnestly scrupulous in seeking to avoid chances for error and failure. She began the work with the avowed purpose to make it a permanent occupation; and I must testify that the experience thus far has served to confirm my long-held conviction that this field, in which women hitherto have done so little, may be and, doubtless, in the future will be one in which they will appropriately and helpfully do much.

While I am not, in a certain sense of the term, a woman's rights advocate, I am an earnest believer in the idea that any woman should have the right, does have the right, to engage in any worthy occupation for the pursuit of which she is capable, and she has the right to proper compensation for work which she does. As a worker she is entitled to no whit less respect, but rather the reverse. In our section of the country there are very many more women than men. Of these women a large proportion are so circumstanced that they must be dependent upon others for support or they must do something to help themselves. How infinitely more honorable is the spirit of self-helping independence.

During a good many years I had an office boy, a succession of office boys, whose services, while not always most acceptable in manner, were a real help. The office-boy is still retained, but for several years his duties have been entirely outside of the office.

One of the most conveniently useful members of the office *personnel* is the office young lady. She comes in the morning and sees that the rooms are aired and dusted, and everything neat and in order, and so kept throughout the day. She sees all the patients as they come in, learns the objects of the calls, makes appointments, and transacts with callers all the business which she can. She assists ladies and children in removing their wraps, and seeks to contribute to the comfort of all. She prepares ready for introduction into the cavity filling-materials of various kinds. She assists in the application of the rubber dam or in the use of other agencies for maintaining dryness. She holds the rubber beyond the border of a far-reaching cervical cavity, she aids in the startings of fillings, she anneals gold and passes it to the position where it is to be packed, or with the hand mallet consolidates it and she does numberless things to help on the progress of an operation. However much we may pride ourselves on our ability to perform any operation unaided, there is no denying that in many operations our own comfort and that of the patient may be far better served by two pairs of hands than by one. After every patient the young lady sees that all instruments and appliances are cleaned and restored to their places before she summons the next patient. She should do as much as possible about recordiny the cases, keeping the books, sending and receipting the bills, and looking after a portion of the office correspondence. For more than a year I have been a good deal helped in my correspondence by the use of a phonograph and a type-writer, the letter being spoken by me to the phonograph, and the young lady and the machines doing the rest. The young lady attends to the telephone, and is the general means of communication about the office, and, as far as possible, between the office and the outside world. She is engaged with the understanding that she is to make herself useful in every possible way about the office.

A practitioner of dentistry who has always worked by himself can have little idea how convenient and how comfortable a thing it it to have such sssistance as I have just named. The presence of a young lady about the office, instead of being looked on by patients as an intrusion, is regarded by them as a pleasant thing, and they are quick to appreciate the shortening of operations and the other contributions to their comfort which she is able to make

I am not proficient at all in the science of economics, but I believe there are sound principles underlylng such combinations of workers as I have described. Not all portions of the work in a dental office require the skill of a specially trained and experienced practitioner. When the demands upon the office become more than the dentist alone can meet, it is wise in him to delegate to other hands that which other hands may do. He may thus retain and conduct a practice of a volume otherwise impossible, receiving therefor a compensation which is shared with those who are given employment, and who share ih the service. Rightly managad, the plan is a consolidation of interests to the advantage of all,—those who serve and those who are served.—Brackett (C. A.), *International Dental Journal.*

ON SUCTION CHAMBERS.

Are suction chambers in plates for edentulous uppers advantageous or not? It is almost impossible to dogmatically answer the question, though it merits consideration. The pressure of the atmosphere being, roughly speaking, fifteen pounds to the square inch, and the size of a plate being hardly ever less than four square inches, and generally more, if perfect suction were obtainable such a plate should be able to withstand a displacing force equal to sixty pounds. At first glance it would seem that nothing like this amount of force is ever applied to such a denture, and, doubtless no such amount of direct downward pull ever is. But from the extraordinary force which the muscles moving the jaws have been shown (notably by the late Dr. Patrick) to be capable of exerting, it is certain that the force of the side to side movement, during the grinding of food, must be very large. Such power being applied usually to one side only at a time, and to the grinding surfaces of the teeth, therefore at a distance from the gum margin of that side, which forms a fulcrum, we have to do with a lever of the first order, in which the weight is represented by the opposite side of the plate. Hence, the tendency whilst grinding food on one side is to displace downwards the other side of the plate, and this with some considerable force ; but, because in levers of this kind the effect of the force applied is directly proportionate to the length of the arm on which it acts, the amount of this force would be variable, and depend directly on the length of the upper teeth. The weight of the denture is as nothing compared with this displacing force, yet in suitable cases, by paying attention to a number of details which need not be mentioned now, and by getting as perfect suction as possible, these levers are counterbalanced, and the denture is kept steadily in place. But this suction is only "as perfect as possible." It can never be anything like fifteen pounds to the square inch, and for the following reasons : First, for perfect suction we must have perfect fit. Will anyone contend that the fit we obtain is at best anything more than relatively perfect ? Secondly, the base to which it is fitted must be a fixed and not a changing base. Thirdly, the exhausting agent must be sufficiently powerful to remove all the air. This we do not believe the tongue can do. On account of the imperfection of our mechanism, more marked in one case than in another, various devices are adopted with the idea of increasing the power of suction. Amongst these are chambers, with or without discs. To take first a chamber alone—how can this act ? Will it increase the power of the exhausting agent ? On the contrary, it will, by giving increased air space, increase the work required to be done. Nor can it affect the base, otherwise than by causing a hypertrophy of the mucous membrane, because its sharp edges act as an irritant, and because pressure over the neighboring part would necessarily cause the blood to run more freely to the piece not pressed on. These theoretical considerations lead us to the conclusion that such chambers do not directly increase the amount of suction. It is, however, alleged that, though they may not do so directly, they assist by lifting the plate away from the hard central portion of the palate and allow it to press more closely home at the margins. This must obviously depend upon the firmness of the margins. In some edentulous mouths the margins are at least as hard as the centre of the palate, and if stumps be present more so. Certainly if this be the object of the chamber it should be of an entirely different shape to that which it usually is, and depend not on the artistic ideas of the maker but on the shape of the hard surface off which it is supposed to lift the plate. To our mind there is far more to be said in favor of a chamber fitted with a disc. Here we have a soft elastic structure, which will readily adapt itself to the surface of the mouth, and so over this area at least we are likely to get perfect suction. But, leaving out of count the fact that this disc generally soon swells up, becoming too large for the chamber, and otherwise worn out, since this would at best be an indication for its constant renewal, there are the further disadvantages that such a disc, though giving fixity at one spot, would not give immobility to the piece at large; and, moreover, the strain and irritation of that particular piece of mucous membrane over which the disc lies is likely to cause a chronic inflammatory process of an undesirable nature. Hence we are of opinion that the use of suction chambers and discs, though time-honored, is one, the advantages of which are not very apparent.—EDITOR, *Dental Record.*

THE FATHERS WROUGHT WELL.

Perhaps one of the worst features of this mutilation of history is the attempt, frequently made, to belittle the work of the past. If some writers could be believed, there was no such thing as a good filling made fifty years ago; that the practitioners of that period had no knowledge of mechanical dentistry or methods of treatment; in fact, in the light of present superior knowledge, are not worthy the slightest recognition. Indeed, if these writers are to be believed, the work of the fathers was but a crude basis for the more perfect superstructure of which they form a part in the present. The men of the middle half of the nineteenth century are fast passing away, and soon there will be none left to bear personal witness to the truth of the assertion, which we unhesitatingly make, that the mechanical and operative work was, at that period, as effective as at the present ; and the mechanical work of the past decade can claim no superiority over that of fifty years ago ; indeed it is doubtful whether it can compare with it in character and durability. It is to be questioned whether any of the younger generation of workers have ever seen such exquisite pieces of plate work as were turned out by Reynolds, originally of Geneva, N. Y. Such a thing as his double-backed gold plates are unknown, as far as we are aware, at the present time.—TRUMAN (J.).

THE SIGNIFICANCE OF GESTURES DESCRIPTIVE OF PAIN IN THE DIFFERENTIAL DIAGNOSIS OF DISEASE.

"The moment the question of pain as a symptom of disease is raised," says Prof. W. H. Thomson in lecturing to his classes, "abandon the consideration of every other symptom and trace that to the end. Question the patient in detail as to its character, location, duration and occurrence, and note carefully his gestures descriptive of the pain, for they are of great significance in determining its nature."

Prof. Thomson, whose skill as a diagnostician is so well known throughout America, has been an acute observer of this symptom of pain for many years, and the following remarks are based upon the results of his observations :

When you ask a patient to locate his pain, he does so by a movement of one or both his hands. This gesture, however, not only indicates its seat, but describes its character and distribution. This is an all important point. If the pain is widely distributed over the whole chest, the patient locates it with a circular rubbing motion of the palm of the hand, indicating the diffused soreness.

The pain of a serious inflammation, on the other hand, is described by first drawing the hand away from the body and then, with the fingers close together or with the index finger extended and the others flexed, cautiously approaching the seat of the imflammation.

In appendicitis the patient does not touch the skin at all when asked to locate the pain. He simply holds the palm of his hand over the diseased area.

With very violent abdominal pains which are not inflammatory, the patient slaps himself vigorously across the abdomen on being asked to indicate the location of his trouble.

If a child refers a persistent pain to the stomach, and there is no tenderness or pressure, disease of the spine is indicated.

In hip joint disease the pain will be referred to a point inside the knee.

With terrific diffused pain in the leg not due to an inflammation, the patient grasps the leg firmly. If it is a darting or laminating pain he will indicate it with one finger.

In the pain caused by the descent of renal calculi and gall-stones, he follows the course with the top of the thumb or index finger.

The pain of hepatic neuralgia or "shingles" is indicated with the thumb or finger.

In joint pains the patient approaches the seat of trouble very cautiously with the hand spread flat.

The degenerative pain of locomotor ataxia is described by grasping the affected area firmly, indicating a band-like pain. Or, if the pain is sharp and lightning-like in the leg, the pain-gesture is perfectly descriptive ; an energetic downward motion, at the same time twisting the hand as though manipulating a corkscrew.

A patient will indicate the seat of a severe syphilitic headache by hammering with the tips of his fingers.

A patient complained of a severe headache. "In what part of the head is it?" he was asked. "The vertex," he replied. On being asked to indicate the exact spot, he placed his finger on the parietal eminence, this he did three times in succession, though claiming to feel the pain exactly on the top. Upon examining the mouth a defective tooth was found. As soon as it was removed the pain disappeared.—THORNE (VAN B.), *National Board of Health Magazine.*

INFECTION BY STREET-CAR STRAPS

Every passenger has had some time to "hold fast," if traveling by rail in New York. The convenient leather strap assists his tired form when returning from business. The delicate lady grasps the loop which prevents her being thrown violently forward or backward.

We have never examined these straps for contagious matter, but the moist leather is a peculiarly fertile medium for the conveyance or propagation of infectious diseases. It is not difficult to imagine the sufferer from some loathsome disease hanging with his bare hands upon one of these straps for a sufficient time to convey the infection to the leather, which in turn may transmit the disease to some unfortunate passenger who enters the car afterward. These straps should always be furnished with handles of brass, and should be washed with a disinfecting solution every day. By this means some of the danger would be abrogated.--*Exchange.*

DENTAL INFIRMARY SERVICE.

Among the factors concerned in the scheme of dental education, none has been a more prolific subject of contention than the financial phase of the clinical work performed by students.

Colleges, collectively and individually, have been called to account for reaping a revenue from their clinics, because it is claimed that by furnishing dental services to those able to pay a fair fee they work an injustice to the struggling practitioner, who is entitled to the benefit of the practice of which the college infirmaries deprive him.

At the recent meeting of our National Association, the colleges of this country were openly charged with fraud, in that, while professing to be charitable institutions, rendering practically gratuitous services to the poor, they as a matter of fact conducted their clinics wholly on a revenue basis. The dental profession, as well as its educational institutions, were further arraigned for their lack of altruism in not devoting some portion of their efforts to the care of the teeth of the poor, to which lack was assigned their failure to achieve recognition as a liberal profession. The problem here involved is one which includes a number of important factors, each of which needs to be carefully considered, and all harmoniously worked out, before a settlement satisfactory to all concerned can be evolved. The care of the teeth of the poor is a problem by itself, which *per se* is as closely related to the dental profession as it is to the dental college, and depends for its solution upon the two subsidiary questions—What ought the profession, and What ought the colleges to do, for the teeth of the poor?

We propose to here limit this discussion to one phase of the subject.

It seems to be assumed by many in the profession that the college clinic is primarily an eleemosynary institution, and any charge made beyond the actual cost of materials used in the performance of operations in unethical; the particular breach of ethics involved being the wrong done to the struggling practitioner by the unfair competition thus brought about.

The view of the function of the college clinic as here noted we believe to be fundamentally wrong. All dental colleges, so far as we are aware, are engaged in the business of educating students in dentistry; and we use the term business in this connection, advisedly. They agree to furnish a definite amount of instruction and training for a certain money consideration; the relation between the institution and the student involves a contract, either expressed or implied, which includes the factors referred to, and thus fulfills in all essentials the definition of a business transaction. The educational function of the college is, therefore, its business, which is conducted solely upon a revenue basis. There never has been and probably never can be any exception to this method of conducting dental educational institutions, until a college is by some means endowed to an extent that will make it independent of the fees derived from students for its maintenance.

A necessary part of the educational equipment of every dental school is its clinical department, where the student is trained in operations upon patients. The clinical department is made a part of the college plant, not for charitable purposes, but as a means of instruction. If it were not needed in the training of students, it would not exist. Hence, its educational feature being its prime motive, whatever of charitable function it may have is a secondary matter, and should be honestly regarded as such. If a college clinic is in any degree a public charity, it is so incidentally, not intrinsically. Hence, the financial question is simply that of the right of an institution to make a charge for services rendered in the course of its dental educational work.

As a matter of absolute right there can be but one final decision, viz., that the institution has a right to make a charge for its infirmary service, just as it has to make a charge to the student for tuition. As a matter of expediency this view may be, and doubtless is, subject to qualification. There is to be considered, on the one hand, the effect upon many practitioners of the competition which the college infirmary induces, and the demoralizing effect upon a certain class of the public which absolutely free dental clinics impose.

There is no lack of evidence to prove that absolutely free clinics are productive of much harm. The very poor are not the class who in greatest number patronize the dental infirmary, except for relief of pain by extraction of teeth. This has been justly attributed to the fact that the very poor have neither the money to pay the customary slight charge for material used, nor the necessary time to devote to the performance of other operations.

The majority of those who apply for filling operations or artificial dentures are those who are perfectly able to pay a fair price for the service rendered, while evidence is not lacking to prove that many who seek infirmary service are well able to pay the average rates charged by private practitioners for dental service. To render free service to the class referred to is not only a possible injustice to the graduate in regular practice, but involves a definite moral wrong by encouraging the effort to get something for nothing—in one word, pauperism.

The competition which the college clinic establishes with respect to the struggling practitioner is perhaps more fancied than real. The graduates of the institution become his competitors as soon as they receive their diplomas, and to prohibit whatever of competition they may engender previous to graduation would be simply postponing the evil day, which of necessity must come later, to be met by the legitimate struggle for existence imposed upon all of us. The struggling practitioner who complains of college clinic competition would probably continue to struggle in the line of resenting all competition, and complain about it under any circumstances. The logical method for the dental college to relieve the practitioner of its competition would be to increase its fees to a point equal with, or greater than, those charged by the latter, or refuse clinical service to any but those unable to pay anything.

Neither method is practicable, for the reason that both would deplete the infirmary of patients, which are a necessity to the dental educational system.

In some instances the compromise measure of exacting a fee only on certain days has been adopted, but the general expediency of such a plan must, of necessity, be determined by the conditions in each case.

The critical attitude of many practitioners towards the details of college methods has, no doubt, its valuable features, in so far as it may tend to bring about improvement, but the expression of such criticism should be tempered with a full appreciation of the importance of the educational institution in the first place, a recognition of its function, and a realization of the factors vital to its educational success. Not the least of these factors is its infirmary, which, for its successful maintenance, is entitled to a proper revenue derived from the service there rendered to a class fully able to pay for it. Finally, the question of revenue from infirmary service would seem to be, under existing circumstances, a question over which neither the dental profession nor any portion of it have the right of jurisdiction, any more than they have over the scale of fees charged by an individual practitioner.—EDITOR, *Dental Cosmos.*

THE USES OF COAL TAR.

The variety of useful products obtained in the laboratory from coal tar is amazing. This substance, formerly thrown away as worthless, serves the purpose of the synthetic chemist admirably, inasmuch as it is a very elaborate organic compound, very cheap and containing a great variety of elements. It has furnished hundreds of new and valuable medicines, particularly anti-fever remedies. From it are obtained the aniline dyes which give all the colors of the rainbow. Aniline itself is colorless, its salts having the brilliant hues. From coal tar also saccharine and dulcine have been derived. Each of them is more than 200 times as sweet as sugar, the latter being more pleasant to the taste.

Formerly no dye material exceeded madder in commercial importance. It was the basis of nearly all dyes, and the root from which it was obtained was grown on a great scale in Europe and Asia. But alizarin obtained from coal tar has destroyed this agricultural industry by driving the plant out of the market. Alizarin is the coloring principle of madder. From coal tar also comes purpurine, which nowadays forms the basis of many dyes. Some time ago Baeyer, a German chemist, manufactured indigo as pure as that yielded by the plant Commercially speaking, the artificial indigo has not been a success, simply because other dyes made in the laboratory do the same work more cheaply. Everybody knows that the "artificial camphor" sold in the shape of "moth balls" is got from coal tar.—*National Board of Health Magazine.*

ADAPTABILITY.

Another peculiarity of cell action is adaptibility. It is possible for us to become accustomed to change of climate ; in fact, it is well known that even in one man there may be found marked resisting power alike against the frigid winter of the extreme north and the torrid summer of equatorial climates. This is due to cell action and reaction. Again, many live in healthful homes who would die in a foul environment, and, on the other hand, others live and do hard work to old age in surroundings that almost reek with dirt and disease. Another quotation from a paper by the author is here also to the point: "In all our large cities we have sections called slums, where the inhabitants are vile in their foulness and where it is impossible ever to find air except it contains enormous percentages of carbonic acid, germs, and malodorous effluvia from all kinds of putrescent decomposition. On the other hand, in the same cities may be found the exact counterpart of the above. In each section are to be found human beings of all ages and in all stages of health. Transpose the most healthy of both sections, and while most of those from the salubrious districts will languish or perish in the slums, those from the latter will all thrive by the change to healthier districts. Those of the first lot who live do so because of their greater vitality and adaptability as compared with those who die. It is, in fact, an instance of survival of the fittest, and is a part of natural selection. The second lot, being placed under more favorable circumstances than before, thrive all the better and are more capable for either good or bad than before. Even some of these, after long enough sojourn in their new environment, could not go back whence they came originally without risk to health or even life. Thus we have illustrated the law of adaptability or natural selection. It varies in different individuals, and in the same person under changed conditions, and at various times.—LEUF (A. H. P.), *Medical World.*

CAUTION IN THE USE OF SALOL.

An exchange says: "*Materia Medica* gives at least one safe intestinal antiseptic. It is Salol."

This is certainly an unguarded utterance, to which attention should be called. Salol is a synthesis of salicylic acid and phenol, and in an alkaline medium, such as found in the intestinal canal, is decomposed into salicylic and carbolic acid, the amount of the latter being 40 per cent. of the total quantity of salol administered. If 50 gr. are given in twenty-four hours, the patient gets 20 gr. of carbolic acid, which is liberated in the intestinal canal in a nascent, and therefore, in accordance with the generally accepted theory, in a more than ordinary active state. It requires but little knowledge of toxicology to recognize the fact that such an agent is not entirely safe.

The fact is, and it is fully recognized in the recent text books upon therapeutics, that the physician must always be on his guard against carbolic acid poisoning —*Fort Wayne Medical Magazine.*

The success of any society depends upon the activity of its secretary and executive committee *after* the meeting, of its President *before* the meeting, of its members at the meeting and of its treasurer and journals *the whole year long.* A society medical or scientific needs not so much of pull as of push and that coming not from a handful of loyal and faithful ones, but from every member of the organization be he in the van or in the rear.—KRAUSS (W. C.).

TREATMENT OF PYORRHEA ALVEOLARIS.

By Frank L. Sibley, D. D. S., Rochester, N. Y.

[Read before the Rochester Dental Society, January 14, 1896.]

Within the realm of dental pathology we are perhaps confronted with no condition more complicated and annoying than this misnamed and mysterious pyorrhea alveolaris. Misnamed in that it specifies nothing; mysterious in that none of us seem to possess any accurate knowledge of its etiology.

I do not hope at this time to bring out any new and startling facts, but as the society has seen fit to inflict me upon you with this double barreled subject, I will endeavor to present some conclusions gleaned from medical and dental literature.

Before passing to the treatment, let us briefly review the pathology.

Recognizing two different systemic conditions in pyorrhea, let us term them for convenience, salivary and lithemic pyorrhea. One seems as fatal to the teeth as the other.

Salivary pyorrhea, as the name would indicate, is due to the deposition of salivary calculus on the necks of the teeth. Usually the first to suffer are the lower incisors and upper first molars, particularly the lower incisors, they being in the direct path of the saliva as it is poured into the mouth.

Whether this is a constitutional condition, or whether the calculus is precipitated by some condition of the fluids of the oral cavity, I am not at this time prepared to state, however, the recession of the gums, absorption of the process, and final loss of the teeth is the result.

This calculus is alkaline and hence can have no connection with the uric acid diathesis; and yet this is pyorrhea.

Lithemic pyorrhea is produced by the deposition of serumnal calculus on the roots of the teeth, below the free margin of the gums. This calculus I have no doubt is due to uric acid conditions.

In this condition the molars are usually the first to suffer, the others being lost in succession.

As before stated the calculus is deposited under the free margin of the gums near the apeces of the roots where its presence causes the absorption of the process, final supuration of the soft tissues, and loss of the teeth. In a large percentage of these cases, you will find that it is hereditary, and I have noticed from the paternal side of the family. In diagnosis, the urine is a factor in determining the lithemic condition. When passed it is clear, but upon cooling to a temperature of 50 or 60 degrees Far., it becomes cloudy, and in some instances throws down a pinkish deposit, which is free urates. On heating or being treated with alkalies it becomes clear. This may be seen in perfectly healthy subjects after a heavy dinner at night, with wines, etc., and can only be regarded as a symptom when persistent without errors of diet. You will find some persons affected at the age of thirty, others at forty, and still others at fifty. Of course the earlier the time at which it appears the stronger you will infer the hereditary disposition to be ; and the more obstinate probably will be its tendency to persist. The resulting condition in the oral cavity is pyorrhea alveolaris, due to the lithemic diathesis. So much for the pathology. I shall confine my remarks mostly to the treatment of lithemic pyorrhea, or that of gouty origin, giving simply outlines of ideas that might be elaborated into a paper of several hours' length. In treating a subject covering so much ground, it must of necessity be touched on lightly, and my idea is simply to open up the discussion of the subject.

I have been surprised at the meagreness of accurate dental literature on the subject. I do not believe that the time will ever come when pyorrhea can be treated with the same precision and guarantee of future freedom from the trouble that marks our operations that are daily with us, such as treatment of teeth, etc. But with proper treatment on the part of the dentist and careful obedience on the part of the patient the teeth may be kept in position many years.

It is necessary that the patient should have a proper idea of the value of the teeth, and the desire to be treated should be strong, and the confidence in the dentist unlimited. Even after a course of treatment the patient should visit the dentist at least once in six months, so that he may observe if there is a tendency to a return of the trouble. Also the patient should be careful to abstain from all habits that are contributory to the formation of uric acid. Another point that may be spoken of at this time, is the patient's ability to pay the fees incurred by the treatment. Practically the same consideration as is usually given in regulating cases, and this point should be thoroughly explained to the patient that there may be no misunderstanding later.

It is my custom when the patient presents himself to me to ask the following questions: Name, age, nativity, family and personal history, habits of eating, as regards hours and favorite dishes. Do they use alcoholic stimulants ? Condition of the stomach, oral cavity, liver, kidneys, and general digestive aparatus, and do they drink much water? The answer of these questions, together with a sample of the urine are the facts upon which I base my diagnosis.

Assuming it to be of gouty origin, we first remove all badly loosened teeth, those where the process has become absorbed so that they are held in place only by the soft tissues. Beginning on those teeth that have enough process left to warrant treatment, remove all the calculus very carefully, as I believe that in this lies the success or failure of the treatment. It is my custom to give two sittings for this operation.

Here antiseptic mouth washes are indicated, my favorite being listerene and water equal parts, or a twenty per cent. solution of glycero-thymolene. I believe that mechanical astringents such as tannin should be avoided, as they do more harm than good. So far we are treating the effect, but the cause still remains untouched. After the local treatment referred to, we sometimes have an apparent cure. The gums take on a healthy color, the teeth tighten up and all seems well; but assuming it to be of gouty origin or the lithemic diathesis, what guarantee are we to give the patient that the trouble will not return in a few weeks or months, as it usually does? As all local treatment amounts practically to the same thing, removing the calculus, stimulating and antiseptic mouth washes, I will not elaborate on that part of the treatment.

The solution of the problem of lithemic pyorrhea seems to me to lie in the constitutional treatment of it. First of all let us consider the general principles upon which the treatment should be conducted. A very simple rule, perhaps too simple, is, when the urine habitually throws down acid deposits, the patient should be prescribed alkalies; if on the contrary he has alkaline deposits, he is treated with acids. In the former case he has soda or potash largely administered and is told to drink lithea waters. Of course under this treatment, the urine clears up and we imagine we have got rid of the uric acid, but the fact is we have simply effected its solution, and by no means have prevented its formation. We read in our medical authorities that uric acid is due to faulty assimilation. Then it would seem proper to stimulate the eliminative processes, in which the liver, kidneys and skin are concerned, for at the bottom of this tendency to uric acid formation there lies what is understood as inactivity of the liver. The theory is that the liver or some allied organ is not doing its duty as an excreting organ. The kidneys have more work than is naturally thrown upon them, and thus the solid matters, or rather some of its ordinary constituents are augmented, not all of them for urea is not necessarily increased, but uric acid is largely increased, and is eliminated not only in solution, but in crystaline forms. Uric acid is very insoluble in H^2O, and although the quantity thrown out may be quite soluble at the natural temperature of the urine, 100 degrees Far., when this diminishes to 60 degrees, 50 degrees or 40 degrees, the acid is deposited and when the quantity becomes larger still even the ordinary amount of fluid associated with it at a temperature of 100 degrees will not suffice to dissolve the whole and solid uric acid that is deposited in some part of the urinary passages.

The treatment which I pursue is to employ such agents as will stimulate the excretory action. No doubt, a powerful agent for this purpose is mercury or podophylin in conjunction with certain natural mineral waters, which I regard as greatly superior to the alkalies and artificially prepared lithea waters. I make this distinction between natural mineral waters and those that are artificially prepared, inasmuch as the effect is markedly different. As an illustration, take a glass of Hunyadi water, evaporate the water and take the salts. Then take a glass of Hunyadi water slightly warmed and note the difference in the effect. It will require four times as much of the evaporated salts to produce the desired effect as it will in the natural solution. Thus you will see that there is some hidden potency in the natural spring water that the artificially prepared lacks. In my own practice, I prescribe either Carlsbad or Buffalo Lithea spring No. 2. The principle upon which these waters are beneficial is that they produce activity in all the digestive functions, and the waste matters which have hitherto been thrown out as uric acid by the kidneys are eliminated in some other form. There are some cases in which you will find that very small doses of blue pill may be most advantageously employed. Those naturally where the appetite and digestion do not much improve under the water alone. I do not propose to say very much about the diet, for it is not to be expected that you can confine your pyorrhea patients to a strict course of dieting, still it is well to advise certain restrictions. There are three chief elements ranked among matters ordinarily taken as diet, which in order to obtain the end in view, must be permitted to the patient very sparingly, namely alcohol, saccharine and fatty matters. Let me refer you to the dietetic system in force at Carlsbad Springs. The use of sugar and butter is absolutely forbidden during a Carlsbad course, and were you a patient there your purveyor would not supply you with the forbidden food however much you might demand it.

It seems, as a result of observation that this system will reduce the uric acid deposit much more than the elimination of meat from the dietary. It is well to caution the patients to be temporate in their food, taking plenty of sleep, outdoor exercise and daily baths with a gentle use of brush and turkish towels, which brings a glow to the skin and helps it to perform its work of carrying off waste matters. Also keep the body well protected with warm underwear.

Undoubtedly some would charge me with going beyond the pale of dentistry in the treatment of this condition known as pyorrhea, but if we admit that it is due to lithemic conditions of constitutional origin, then we must treat those constitutional conditions if we would effect a cure, or we must give up entirely the treatment of pyorrhea alveolaris.

ANOMALIES OF LOCATION.

Translated from the French expressly for the Odontographic Journal, by H. E. W.

Heterotopy, or location of a tooth at a point which it does not occupy in a normal condition.

These anomoalies are of several kinds :

1. Transposition ;
2. Displacement or generation outside the arch ;
3. Generation outside the buccal cavity.

They should be distinguished from anomalies of direction ; in the latter the tooth occupies its relative place in the dental series, and has the neighbors it ought to have ; in anomaly of location, on the contrary, there is evolution in the place of another tooth, outside the arch, or even outside the buccal cavity. They are rare in temporary dentition, exceptional in the permanent series of the inferior maxillary.

Transposition.—Takes place between neighboring teeth, canines and bicuspids, lateral incisors and canines, and *vice versa;* the wisdom tooth has been found, very exceptionally, in the place of the second molar ; it is especially in the anterior region that this anomaly is observed. Simple transposition is more rare than the following varieties.

Displacement or generation outside the arch.—An anomaly of location which can only be an accentuation of that of direction, the tooth having found its normal place already occupied by its neighbors, this often occurring in the case of the canine. It is only an anomaly of location properly so called, when the tooth is located in the palatine vault, at a notable distance from the alveolar border, or on the floor of the mouth, in the canine fossa.

Generation outside the buccal cavity.—The evolution of one or several tooth germs at points more or less distant from the buccal cavity, from the maxillaries themselves, is relatively frequent ; the following facts are established, notably those of dermoid cysts.

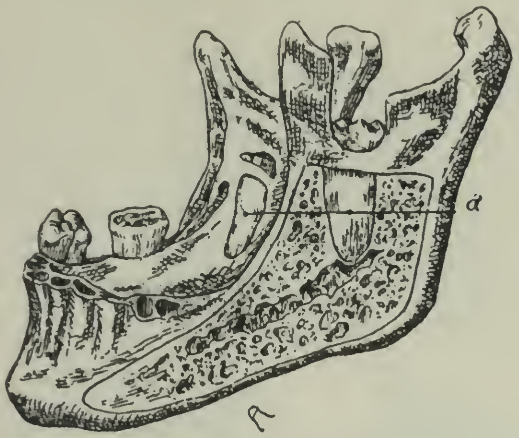

Fig. 1.

Inclusion in the maxillary is not rare, especially of the third molar. The presence of a tooth has been observed at the rising apophysis of the inferior maxillary, at the floor of the nasal fossae, in the maxillary sinus. In one case of Cartwright, the crown of the third molar showed itself above the skin near the angle of the maxillary. Magitot cites cases of heterotopy by location in the vomer, the sphenoid and the malary bone. Finally, teeth are often found included in dermoid cysts, but these demand special mention.

Generalities in regard to dermoid cysts.—The character of the dermoid cyst is that of a sac of membrane approaching the texture of the skin, enclosing epidermic products, sebaceous glands, hair, teeth and nails. Those containing teeth belong to the variety called compound. They are encountered in different regions of the physical economy ; the buccal floor, the maxillaries, the ovary, the testicle, the sacro-perineal region, etc. They are sometimes unilocular, sometimes multilocular.

Teeth are frequently observed in these tumors. They exist 63 times in the 129 cases chronicled by Lebert, and 46 times in the 245 by Pauly ; but it is impossible to judge accurately of their frequency from observations cited by authors, as the principal ones published are of cysts with complex contents.

We find in these productions the same variability as in hair. They are always numerous ; the most extraordinary case with which we are acquainted is that cited by Ploucquet in which more than 300 were counted. Tomes observed more than 100 ; Schnabel, in a girl of 13 years, found a cyst of the ovary containing 100; in one case of Cleghein there were at least 44.

All varieties of teeth have been encountered; incisors, canines, bicuspids and molars, and even wisdom teeth. But often they are normal and more or less rudimentary, presenting ordinarily a conoid form. The roots may be defective, in which characteristic they resemble, according to Salter, congenital teeth already erupted at birth. Sometimes the teeth are free in the cystic cavity, sometimes implanted upon osseous fragments, or simply attached to the walls. In 63 cysts Lebert has noted 30 in which the teeth were implanted upon a bone, 10 in which the implantation was mixed—some of them upon the bone and others on the soft parts or detached, 10 in which they were free, and where there was not a vestige of bone; in the 13 last cases the indications were insufficient.

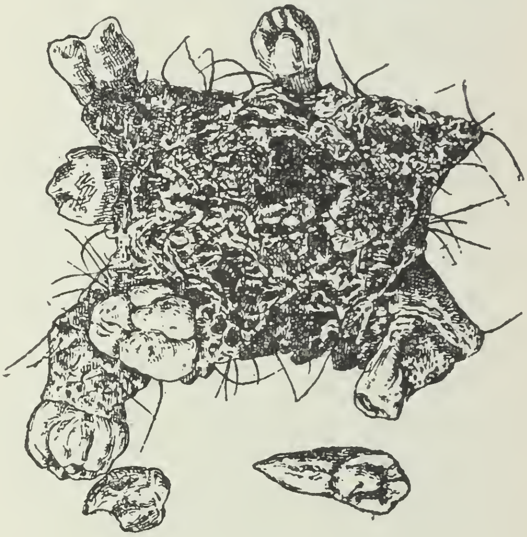

Fig. 2.

When teeth are implanted upon a bone, their grouping is irregular and recalls in no degree the normal disposition. Thus in a cyst operated upon by Pean (These de Cousin, obs. VI, page 122) a bouquet of teeth was discovered, arranged in a curvilinear disposition: comprising, two contiguous incisors, then a canine, then, three or four millemetres removed, another canine, and outside upon a fragment of flat bone, two canines and finally a seventh tooth isolated (Lannelongue, Traité des kystes congénitaux, p. 70).

These teeth are always altered, partly absorbed, which has given rise to the belief that they were carious. They undergo all the perversions of structure of teeth of vicious evolution: extensive interglobular spaces, dissociated enamel, granular; the pulp cavity is often absent.

In some cases teeth located in dermoid cysts are of normal structure. In a case of Dr. Jentzer's reported by M. Redard, they were so. The osseous fragment supporting the teeth measured in its greatest longitudinal diameter 0.13, transversely 0.025, its greatest thickness was 0.018, its weight 14.7 gr. The teeth are implanted upon one of its borders. They are well constituted molars, with large crowns well cusped. One of them shows three roots at one of the angles of the osseous body ; another molar in the same condition is at the opposite angle, and between these two is a third, showing a crown. A fourth molar is implanted near the first angle, showing only its crown. Upon another edge is a bicuspid firmly implanted in the middle of the bone. At a third angle is a cup hollowed in the bone, containing a canine, a milk tooth, the roots of which are absorbed so that it is detached at a touch. This tooth weighed 0.237 gr. The osseous part is porous in places, smooth in others, presenting all the characteristics of normal bone. In the cystic liquid floated an adult canine, well formed, weighing 0.415 gr. A cut of that tooth has permitted an examination of the enamel, the dentine and the cement, in all points similar to those of ordinary teeth. It possesses a pulp ; the pulp canal exists and permits the passage of a needle.

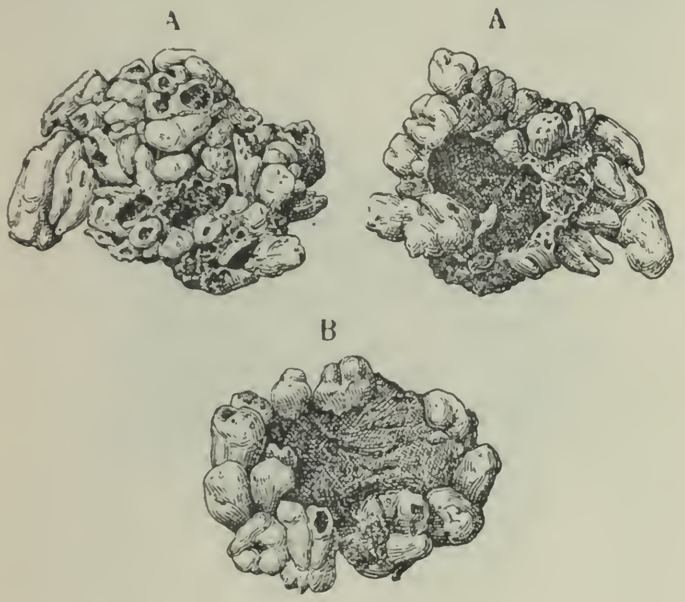

Fig. 3.

Figure 3 represents the exterior configuration of two dentigerous masses belonging to the collection of M. Prevel, evidently part of two dermoid cysts, and it is under that title that we describe them here. 3 resembles an irregular circle formed of 18 dwarf teeth badly grouped but having a certain arrangement: Convergence of the roots, divergence of the crowns; the connection is of fleshy tissue showing traces of ossification at some points; the greater part of the teeth having their roots directed toward the center, the crowns forming a fan at the periphery. None of them has normal demensions, they seem a miniature, a reduction to one-tenth of regular size; some have a bifid root outline, but the majority are clearly uniradical. The crowns approach the conoid form; but some present a table with rounded edges, like the molars called amorphic and eroded. The internal cup seems to have formerly given attachment to a pedicle making a base of implantation.

The dentigerous mass *A A'*, is more heterogeneous in its elements and of a form less regular. It has some points of resemblance to the first: a concave part seeming to have given attachment to a pedicle, the convergence of the roots, the divergence of the crowns. The greater part of the teeth are well formed and some appear rather like nodules of enamel. Two roots have dimensions nearly normal, one shows an exostosis. The crowns and enamel nodules have undergone evident absorption at some points, the enamel shows lacunes and an irregular arrangement.

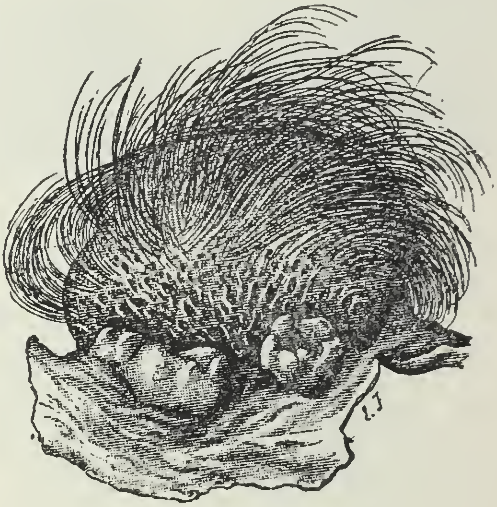

Fig. 4.

Figure 4 shows a multilocular cyst containing teeth and hair. The middle tooth is the largest, its shape corresponding to that of a permanent molar, its roots, resembling those of a wisdom tooth, are curved in the arc. The long diameter of the crown is eleven millimetres and the small one eight. The milk tooth on the left has an inclined position, that on the right corresponds also to a milk tooth. These three teeth are surrounded by a smooth mucous membrane, extending to the tampon of dermal tissue and continuous with the external skin which is provided with hair. Natural size. (Wedl, Pathology of the Teeth, p. 172).

Teratogenesis.—The causes of anomalies of location are obscure, they are not the same for simple transposition, intra-buccal evolution and for dermoid cysts. It may be that the first were due to a vicious direction of a fragment of the epithelial cordon from which spring the dental germs ; there would then be in these cases displacement, follicular migration (Magitot), from mechanical causes affording a plausible explanation. It is not the same with dermoid cysts, the origin of which is less established. The most defensible hypothèsis is that they result from an enclosure of part of the blastodermic fold. Originally the little epithelial mass is simply an evolution of the epiblast ; then, little by little, it withdraws from the surface of the ectoderm by the fact of the development of the neighboring parts, and during this time the epithelial pedicle which attaches it to the ectoderm must progressively elongate. But this elongation may be insufficient if the neighboring parts develop more rapidly, so that the continuity is broken between the ectodern and the little epithelial mass, thenceforth independent (Lannelongue loc. cit. p. 107).

In a word, an embryonic fragment of the cutaneous system finds itself imprisoned, and in spite of the error of place, it developes in obedience to its proper evolutive force. To explain the frequency of the inclosure in the scrotum and the ovary, is invoked the temporary vicinage of the Wolffian body which gives rise to the organs of generation, and of the external blastoderm whence the teeth issue. This theory explains the observed facts well enough, and is actually accepted. There would then be a reason for the inclusion in the abdominal organs.

What is difficult to understand is the great number of teeth more or less rudimentary encountered in dermoid cysts. One is tempted to admit that each embryonary cell evolves by its own proper forces and constitutes thenceforward an organ more or less imperfect. By anomaly of location, there would then be sisciparity of the embryoblastic elements of one or of several dental germs ; then these dissociated elements would constitute teeth vicious in form and structure.

Anomaly of location justifies intervention only when it gives rise to consecutive disorders. These may be grave and involve the maxillaries, on the enclosing organs of the teeth affected by heterotopy, in which circumstances resort must be had to surgery.

CRANIA AND TEETH OF PRIMITIVE MAN IN IRELAND.

A handsomely printed and illustrated book of nearly seven hundred pages from the press of Longmans, Green & Co., is "Pagan Ireland," an archæological sketch, by W G. Wood-Martin, member of the Royal Irish Academy, and author of "Lake Dwellings," "Rude Stone Monuments," "History of Sligo," and numerous other entertaining and instructive works on Irish subjects, ancient and modern. The following extract is of value not only for its facts but also for its conservatism in regard to theories based upon questionable classifications :

"The form of skull attributed to the primitive inhabitants of Ireland is distinguished by great length from the front to the back of the head, and comparative narrowness of the skull ; hence the type is by scientists styled dolicho-cephalic, or long-headed. It is alleged that the specimens presented are too numerous and been found over too wide an area to permit of their being considered mere varieties—especially as a similar form of skull is to be met with amongst the aboriginal remains found in England and over a large proportion of the continent of Europe. * * * * * *

"The second type of Irish crania is, by some, subdived into two classes, both, however, belonging to what scientists have named a brachy-cephalic or round-headed race.

"The first-class is represented by the Celt. The skull is of medium size, well-shaped, but with projecting upper jaws ; the chin not massive ; the nose short and wide, exhibiting the peculiar characteristics so familiarized to the public by caricaturists of the Irish peasantry.

"The second subdivision of the crania of the round-headed race is represented by what may be designated the Norse type. This hardy race, or races, be they styled Formorians, or sea-rovers, made their appearance on the Irish coast long before authentic history begins. The Norse skull is regular, the nose long and aquiline, the face narrow, the forehead straight and of medium height ; a long oval outline in the vertical aspect of the skull, whilst the lower jaw is distinguished by its square outline and massive structure—giving a distinctive character to the face—and it differs but little from the form of skull of the Normans.

"There are also slight varieties in the form of the crania of the long-headed or primitive race, for the progenitors of the early inhabitants of Ireland probably arrived in detached groups and at considerable intervals of time, doubtless representing successive immigration of varying tribes and peoples.

"Variety of shape of crania (within certain limits) appears to be the law of nature—not the exception—and each race exhibits countless variations of mental combinations. This is suggestive and calculated to impress the necessity of great caution and extensive observation of facts, before venturing to draw general conclusions. Classification of crania into distinct types, and then making that type the body of the race, is a theory of doubtful value. At any public meeting how many varying types of crania may be observed. Open an old pagan 'Callragh,' and the same result becomes apparent; skulls of every size and form may be unearthed, though all the remains are referable to about the same period of time, and probably all may have belonged to one sept; yet had these skulls been found dissociated, they might have been viewed as representative of totally different races.

"It is worthy of observation that extreme types of crania were represented in two specimens discovered in the well known 'find' within the tumulus in Phœnix Park, Dublin, demonstrating that the commonly received theory of cranial forms being more and more stereotyped the further back we penetrate into the obscurity of the past, is not always corroborated by accurate observation. The occupancy of a common tomb would imply that they were contemporaneously interred, and that they belonged to members of the same family or tribe, and as only bone and flint implements—together with a shell necklace—were found, it may be considered that the period of interment was that of a barbarous state of society.

"In most instances of the discovery of perfect crania—even those of children—the teeth appear to be much worn, as if by attrition of some very hard kind of food, and the process of degradation keeping pace with the age of the individual; the teeth, nevertheless, although they may be much worn, yet, with few exceptions, are found to be in a sound and healthy condition. The gradual abrasion of the teeth materially influenced by the nature of the food used. This is proved by the fact that the teeth of sailors, who, during the greater part of their lives, live upon hard biscuits, are often found to be much worn down by the constant friction produced by this diet."

Read the article in this issue from the *Dental Record* on suction chambers and discs, and then Dr. Burchard's contribution to the to the *Dental Cosmos* for November. You'll know some things better.

DENTISTRY AMONG THE COLONELS.

By Wm. W. Belcher, D. D. S , Rochester, N. Y.

> If there's a hole in a' your coats,
> I rede ye tent it,
> A chiel's amang you taking notes,
> And, faith, he'll prent it.
> —Burns.

"While an undergraduate at the Louisville Dental College," relates a brother practitioner, "I received several letters from a dentist who resided some 150 miles in the interior and was anxious to secure an assistant. To believe the statements made by him, there was no doubt of my making my eternal fortune ; as I was depending on my own exertions to pay my way through college, I concluded, after some hesitation, in accepting his terms of equal partnership.

Borrowing the necessary cash of a friend, I set out on my journey for fame and fortune. After a tiresome ride we arrived at Debre, a place of some 1,000 inhabitants, so it was said, though where the people kept themselves I was never able to ascertain. Upon reaching the "station" which appeared like a hen coop perched on a small elevation of land ; I could see no one who appealed to my fancy as a dentist ; in fact the only person at the station was a tough looking party, wearing a rough flannel shirt, with pants tucked in his boots. I was accosted with the inquiry: "Be you the dentis' ?" I answered "Yes sir." "Kem on then, thets my office right daown the street."

No novel could exaggerate Dr. Fides. I felt, in beholding him, like a man who had read of the dodo without compromising himself by a belief in that bird, but who had at length lighted on an unmistakable survivor of the species in the trackless wilds of some undiscovered country. As our acquaintance progressed, I set him down as the most unique specimen of the genus Homo it had ever been my fortune to encounter. He was one of those anamolous men who exist elsewhere as curiosities ; but whom the philosopher must visit in their mountain fastness to see in their full development and possessing a normal status among mankind. As we progressed down the "main street" on our way to the office, I observed that all the houses were one story high and under each corner was placed a block elevating the building from the ground ; before nearly every house was perched a long pole with a bottle inverted on the top. This was a "charm ;" its special purpose I never ascertained, but the custom was universal. Each householder dumped all refuse in the street. The pigs, which were allowed full run were the public board of health. On our way to the office, I discovered that my business partner was an "advertiser" from way back. Spying an acquintance across the street he hailed him: "Kem over here Sandy, I want ter interjuice yer to my pardner. This 'air Professor Davis from Louisville; ruther dudish, but thet 'air what takes with ther gals, ye know; Professor Davis air a dandy den-tis; kem up and let him stuff yer tooth, Sandy." Sandy 'lowed that "p'rhaps he might." This was repeated some half dozen times before reaching the one dental establishment of the town which like its fellow structures was perched on four blocks and appeared as though it might run away with itself some dark night.

The office was jointly occupied by a little dutch tailor. The dental chair on one side of the establishment and our friend the tailor on the other. "Make yourself at hum," said the doctor. "Naow I hev some bizness outside this arternoon, and I wanter 'splain to yer my way o' doin' things. O' corse we all hev our ways —naow my strongholt here is pullin' teeth; we pull 'em in three ways—old-fash'n'd way, fifty cents; thet hurts a good bit. 'Odonto,' seventy-five; 'oil of gladness,' one dollar; thet's the best, allers pull 'em with th' 'oil o' gladness,' if ye kin."

The medicine case of my new "pardner" was somewhat limited, consisting as it did, of two remedies, *camphor* and *vinegar.* For fear that my late associate should conclude to "push" his "local" and thus trap the unwary, I considered it my duty to inform the public, that his "oil o' gladness" and "odonto," are camphor, simon pure. Vinegar, I was informed, was his sheet anchor; "Cayn't keep hous' without hit; nothin' like hit fer cleanin' teeth. I jes' putter 'round an' hev' 'em wash the'r mouth out with vinegar a good bit; charge dollar an' a ha'f fer that."

The laboratory was in a shed adjoining—the plaster and slops were shoved through a hole in the floor, and as all the refuse was dumped through the same opening, I concluded from the terrible odor, that the pigs had not had a fair chance at it recently.

Observing no tools or laboratory instruments I inquired what he worked with and learned that he had the whole outfit, vulcanizer and all, nailed up in a box, "so's to hev 'em handy in case er fire," as he informed me. It was quite as handy to send to Louisville for an outfit as to attempt to unfasten the box they were placed in. Why he never put his three pair of forceps along with the laboratory tools I never found out.

I soon learned that my business partner expected me to do all the work and divide the profits, but as they appeared to be very conspicuous by their absence, this gave me little concern.

Dr. Fides, besides following dentistry, "farmed it a bit," and swapped horses or any other commodity. I was told that he was as sharp as a steel trap in a trade, and that the man who could best him on a horse deal was yet to be born. His visits to the office were like the cash payments, few and far between.

One day, I had for a patient, an overgrown girl from the backwoods, who looked as though she had been "brought up by hand;" her teeth were encrusted with black tartar, and as a result they were as dark and uninviting as they very well could be. Dr. Fides happened in, and spying the patient, opened up with: I kno' what's th' matter with thet gal, she's got bla'k kanker—yes'r, I kin tell bla'k kanker az fur az I kin see hit, she's got bla'k kanker ov the gums; naow, doctor, you jist skarify th' gums an' skarify 'em thoro an' thet gal 'll git well—but thet's bla'k kanker, kyant fool me on thet.

About this time I began to have serious doubts as to the feasibility of gathering a fortune practicing dentistry in my present field—as no one had any money—"hog-killin' time" and "when we sell our tobaccy," were the days of promised payment. Both of these periods were somewhat remote and we concluded not to wait; but again availing ourselves of the good offices of our friend in the city, borrowed money to return to civilization.

It was not without regret that the citizens of Debre saw us depart—particularly the boarding mistress, to whom we were indebted for two weeks board, but the "doctor," 'lowed he would 'tend to hit at hog killin' time.

Oh, for a touch of civilization once again; no more tin-peddlers for bed-fellows, the luxury of a cake of soap and a whole towel all by yourself!

We often wonder how the girl with the terrible "bla'k kanker" is progressing; it was an interesting case and we would like to have watched it closely, for the benefit of suffering humanity, but the allurements of civilization were not to be ruthlessly set aside."

BLACK'S INVESTIGATIONS OF THE HUMAN TEETH.

In the judgment of the writer, any attempt to express an opinion for and against the work of any one where this has been based on actual investigation would be not only valueless but the height of folly. Dentistry has had entirely too much of this talk for talk's sake, and it has therefore been with some degree of satisfaction that we have observed that, with but one exception, the entire dental world has been silent to Dr. Black's work. It is a reflection on the intelligence of dentists to have this charge made by a contemporary: "Dr. Black's paper was published in May last. Up to this writing there has been no response. Are we all paralyzed?" We prefer to think that intelligent dentists, having found the conclusions at variance with experience, have decided to wait before giving expression to their thoughts until some one with time, means and practical knowledge could repeat these experiments, and confirm or reject them.

While this view is true, it still remains the duty of the faithful observer to note apparent errors of investigation here or elsewhere.

Viewed in any light, the labor of this very able worker in untrodden fields must be held to be most painstaking and thorough, and quite equal to any that has preceded it. This is Dr. Black's due, and while it is impossible to concede results entirely satisfactory, the fact remains that he has led the way for others to follow.

The difficulties attending an investigation of this kind are innumerable, and, it is feared, will ever remain insurmountable. The controversary between "soft teeth" and "dense teeth" has not been settled by these investigations; indeed, it is probable that this will continue with increased intensity.

While desirous of giving Dr. Black due credit for all that he has done, as represented in the series of tables in the May number of the *Dental Cosmos*, it must be clear to any one dispassionately reviewing his labors that in the first paper is demonstrated but one thing, and that is that dentine becomes more dense by age.

Dr. Black states that his investigations are based on an effort to find "differences in the density, percentage of lime salts, strength, etc., occurring in human teeth, and to find what relation, if any, such differences may bear to dental caries and the diseases of the teeth" He says further: "I have chosen to confine the examination for density, proportion of water, lime salts and organic matter to the dentine, as best expressing the character of the teeth as a whole."

For the collection of material he was forced to depend on the good offices of many professional friends. They were instructed "to place the teeth in an envelope just as they came from the mouth, write on the envelope the nativity, age, state of the genera health, color of the hair, to class the teeth as bad, fair, or good as to occurrence and rapidity of caries, record the condition of the gums," etc.

There are two conditions that would seem to the general observer to invalidate the entire series of experiments. In the first place, dentine was taken as the tissue best calculated to represent density, or rather the character, of the entire tooth. The propriety of this selection may well be questioned in view of the fact that it is not dentine that is the resisting body against the attacks of caries, and that therefore inferences drawn from experiments upon this tissue must be largely fallacious ; or, at least, they can have no force as antagonists to clinical obsevations.

The method adopted in collecting material seems faulty. It probably could never be otherwise ; hence no reliance can be placed on conclusions. Teeth are "placed in an envelope" by persons, and marked "bad, fair, or good" as to progress of caries. These individuals may be thoroughly careful and competent to make the selection, but there is no evidence that such is the fact. It is in the experience of every intelligent observer that the "occurrence of caries" is no test as to the character of the teeth. Those regarded in our own practice as the best in resisting power have melted with great rapidity by change of environment, and it is a notorious fact that the so-called dense teeth will decay by change of climate superinducing general physical endurance. The difference between the great sensibility and poor character of the teeth of the Sclavonic people as compared with the Germans, closely contiguous, has demonstrated to many and to the writer that there is a wide difference in the structure of the teeth not discoverable by the most exact instruments. The same diversity in structure is not confined to certain nationalities, but abounds, as a serious evil, in this country of mixed inheritances. To attempt therefore to classify the average superior quality of teeth of the German, English, or Irish by the amount of dental caries existing among these races would be simply to exhibit ignorance of conditions. Dr. Black says in explanation of this that "there has been no selection whatever of teeth for this work, but such teeth as came into my hands I used, all of them that *were reasonably perfect at the gingival line.*" Dr. Black assumes too much when he asserts that dentists have interpreted clinically teeth firm and clear in appearance, with neat gingivæ, clean interproximate spaces, and free from caries as "teeth that were well calcified," and teeth "coated with some form of glutinous deposit, perhaps, and rapidly progressive caries in numerous spots," as indicating "soft teeth or teeth that are poorly calcified."

It is difficult to conceive of a dentist so poorly skilled as to differentiate these important conditions upon such an absurd basis. That teeth become denser by age was known in the infancy of the profession, and while it is very satisfactory to have this demonstrated beyond cavil, the fact remains that nothing really new has been added to dental experience ; indeed, it may be questioned whether these investigations have not tended to obscure knowledge already obtained and have made the path of the conscientious operator and teacher doubly difficult.

"There is no basis for the supposition that the teeth of children under the age of twelve *are too soft* to receive metallic fillings." This is the dictum deduced from the prepared tables, and based on these it is doubtless correct, but what experienced operator ever founded his objection on teeth under twelve as being too soft if by that is meant lack of density. This term has, it is true, been used wrongly, and intended to convey the idea of immaturity. In that sense it is correct. The child of twelve and for many years thereafter has not teeth fitted to "receive metallic fillings," notwithstanding the tables presented or the high authority that produced them. These teeth are not fully developed, the tubes of the dentine are larger and consequently more readily affected by external irritants let these be from whatever source derived, whether thermal or medicinal. To deny this fact is to attack the very ground-work of dental histology, and we therefore do not for a moment suppose that Dr. Black means to be thus understood.

There is possibly very injurious results to follow from this strong statement that "there is no basis for the supposition that some teeth are too soft or too poorly calcified to bear filling with gold, . . . since all are found to be abundantly strong." Advice such as this can only result in great harm, as it antagonizes the recognized observations of the entire dental profession for the past century. No intelligent practitioner can accept it, no matter what the authority may be that supports it, for, as stated, it is not true. If this is to be the teaching of the future, the students of the new era are certainly to be pitied, for a world of difficulty and many mortifying experiences await them. There must be a discrimination made as to character of teeth, and this should be based not on instrumental tests, but on more exact and reliable observation through daily experience with all sorts and conditions of men, women, and children.

If there be the same quantity of inorganic material in teeth of the same age, why, may it be queried, do we find some teeth in which caries progresses with extreme slowness, resulting in the transparent zone of Tomes, others with a character of dentine not much above chalk in texture, decaying with great rapidity? There is no explanation for this in the tables presented, nor is any attempted beyond the very unsatisfactory assertion that environments differ. This explanation cannot be accepted.

If Dr. Black had made selections instead of declining to make any distinction between teeth, and had secured material from a mouth recognized by those competent to decide as being of the purely soft variety, and submitted these to the test which he gave to those selected indiscriminately, results would have been obtained which would have gone very far towards settling this question. In the opinion of the writer, white teeth are by no means the poorest teeth, and this view is confirmed by Dr. Black, although how the experiments prove it is not clear, as all teeth become whiter as the drying out process continues. The impossibility of securing teeth of the character mentioned must remain a bar to exact observation, but until this be done we must decline to accept the conclusions of Dr. Black, except in a modified sense.—EDITOR, *International Dental Journal.*

"THE DOCTOR'S DEGREE."

Here's a pretty how de do;
Hear, oh hear it bray.

STIRLING, Ontario, Canada.

Editor *Medical World:* Is the title "Doctor," which has been given for many centuries to those who have reached the highest distinction or position in divinity, law, medicine and philosophy, in any sense honorably sustained by being bestowed on such callings, or rather on such personages who have graduated as dentists, druggists or veterinary surgeons? We answer: No. Let the honorable title, "Doctor" be given as D. D., LL. D., M. D., or Ph. D. and do not throw pearls to swine by giving out such baubles as D. D. S., D. V. S., as such are, to use a vulgar expression or word, but belittling an expression as a title which savors of learning, culture and distinction. No. Let no institutions but universities give the doctor's degree and let such colleges conferring degrees in medicine which have as much standing as commercial colleges be ostracised as catch-penny institution, for such they are. The grandeur of the title of doctor is well illustrated in that immortal work, "Beside the Bonnie Brier Bush," by Ian Maclaren. Read it and reflect on the grandeur of the doctor's degree in its proper faculties. Read it and reflect on the nobility of Rev. Dr. Davidson (the D. D. of the old Kirk), and "Dr. Weelum" Maclure, the Drumtochty doctor for forty years. Read it and reflect if the title doctor would sound well if given to a dentist, a farrier or a druggist?

J. S. Sprague, M. D.

(The doctor inclosed an extract from a Canadian newspaper showing the large number of graduates from their colleges, a majority of whom emigrate to the United States.--Ed.)—*Medical World.*

Verily, this be a plum. Here we have "learning, culture and distinction," for hath not the writer read *Bonnie Brier Bush*? Notice as further evidence of high degree among the cultured, the superior style of the writer, his elegance of diction, fine discrimination in the choice of words, their delicately shaded meanings. Oh, yes; this is culture. Notice, too, that he does not hide his degree under a bushel, perhaps because it needed air. It's a pretty little thing and should be kept well within grasp, or like the "pearls" with which he takes special pains to associate it,—D. D., LL. D., Ph. D.—it might get into the hands of "personages," otherwise according to this distinguished party "swine," which history says is just one remorse from a *schwinagle*, "a kind of wind instrument." Hold fast to your little degree, "Doctor;" nurse it if you can; feed it Mellen's food or granum if you must; coddle it; pat it on the back; dance it on your knee, and some day when it grows up to the flush of full manhood it may call you "papa."

THE NERVE CELL AN INDEPENDENT ENTITY.

In the preface to his "Atlas of Nerve Cells," Dr. M. Allen Starr lays down a few propositions of interest and value to those who care to keep informed as to the further development of the cell theory. Many views hitherto taught must be discarded, and some of the supposedly fundamental data very much revised. We make a few extracts:

The nervous system is now known to be composed of a vast number of independent units, called *neurons* which consist of a cell body with two varieties of branches, called *dendrites* and *neuraxons*. The cell bodies vary in size, shape, and appearance; their dendrites, formerly known as protoplasmic processes, present great differences in form, length, and manner of subdivision; their neuraxons, formerly called axis cylinder processes, and believed to have no branches, are known to give off many little collateral offshoots as important as the main trunk.

The arrangement of these neurons varies greatly in different parts of the nervous system. In the spinal cord they are collected into groups arranged in a long cylindrical column. In the cerebral axis they are scattered among the various nerve tracts as well as collected into separate groups. In the basal ganglia they are gathered into large masses separable into divisions. In the cortex of the cerebrum and cerebellum they are spread out into thin but very extensive layers containing a great variety of cells.

The interrelations of these neurons is also a subject of importance which recent researches have demonstrated satisfactorily for the first time. The old theory that the processes of adjacent cells join together, forming everywhere a fine network of nerve fibres within the gray matter, has been discarded. For the method of Golgi has shown that each sell is an independent entity, its branches and subbranches of both varieties preserving their identity from origin to ending, interlacing, it may be, with those of other cells, as the branches of trees in a forest may interlace, but as really distinct and separable from each other as are those trees with their twigs and leaves.

NEW VULCANIZER.

It may interest those engaged in prosthetic dentistry and who take pride in their laboratory equipment to learn of an appliance that would seem to be well nigh perfect. It is described as unique in design, simple in construction, and of course effective within the limits necessitated by the vulcanizing process. Screws, bolts, clamps and other devices, familiar to dentists have been discarded, and a device substituted that makes the opening and closing of the boiler the work of a moment with the fingers of one hand. Other necessary and convenient attachments have been simplified and reduced in size and changed in position, and to that degree that the term *New* may be applied without fear of disputation. Circulars will be issued soon, giving cut and description, and later it will be illustrated and described in the ODONTOGRAPHIC. It is hardly necessary to add that the patents now pending are claimed in full by the Rochester Dental Manufacturing Co.

THE SHORT-CORK FIEND AGAIN.

Beware of the products of the man who is small enough or inconsiderate enough to use a short cork, or worse still, who cuts it off for the questionable purpose of smearing it with sealing wax or other equally-difficult-to-remove resin. He uses a mighty poor cork, or cuts off a good one, nastifies the lips and neck of the bottle, and finally by way of "adding insult to injury," compels the purchaser of his goods to go in pursuit of a clean and suitable stopper. We have mentioned this matter before and witnessed a few attempts at reform, but "there are others." A manufacturer who will thus tamper with his own package, may not be over particular as to the contents. Other things being equal, buy full-corked goods, minus also the smear.

PELLETS.

Some high authority is quoted as saying: "The function of new drugs is to meet the requirements of those who do not know how to use old ones."

Evens' root-dryer should be more used. Drying by wet processes may be made to answer; but it has a small place among the "surest" ways.

Beware of iodoform in root-canal filling materials. The sensitive patient will detect the stuff by taste at most inopportune times,—unto the day of his demise.

When will speakers and writers on root treatment discard the word *nerve*, when they wish to be understood as referring to pulp? Wraggles himself grows weary.

To get a crown the proper depth below the gum, when you have done fitting, if still in doubt, paint with chloro-percha, or take an impression of crown and gum in plaster.

Dr. Brackett has had much experience with assistants, and of the most favorable kind. His discussion of the whole subject is entertaining, instructive and timely. Read it.

We usually copy from our contemporaries verbatim; but how it would please us all, even those quoted, if the first editors would only wield their blue pencils more generously!

According to Dr. Merriam octogan piano wire may be filed and flattened without changing temper and made into excellent root-cleansers. He commends also what is known as the milliner's needle.

Brass handles to the "hold-fast" straps of street cars are advocated, because of the ease with which they may be disinfected. Some other fellow thinks the cars should be set on fire occasionally.

The discussion of methods of root treatment is very suggestive as to the vast quantity of statements dentists are bound to take for granted. What some know, where knowledge is out of the question, borders on the marvelous.

To lift the palate of a rubber plate from the roof of the mouth in which it happens to rock when new, as well as after repairs, fill in the palated side with plaster and later thoroughly warm the plate on the holatal side over a flame. The plate may be seen to draw from the model.

Those who harp on the alleged wrong wrought upon struggling practitioners by the dental college infirmaries, should remember that this department is "a part of the college plant, not for charitable purposes, but as a means of instruction." It is a necessity, which is often a thing's only right to exist.

A friend whose experience with the world comprises more years than are usnally embraced in student life has taken to biology. A few days in the laboratory studying forms and structure of minute organisms and failing to find in them the beautifully executed details of the foreign made charts that graced the walls of the room, concludes,—"While it calls for a deal of faith to become a good churchman, it necessitates a damned sight more to become even a common everyday believer in the graphic teachings of this alleged science of life." His respect, however, for the *artist* in biology continues to rate as most profound. This gentleman is still a power in many an unseen field.

REPORT OF TREASURER OF WORLD'S COLUMBIAN DENTAL CONGRESS. IN FULL FROM MARCH 23, 1891, TO JULY 23, 1895.

RECEIPTS.

American Dental Assciation	$1,000 00
Illinois State Dental Society	321 00
Iowa State Dental Society	100 00
Southern Dental Association	200 00
Washington City Dental Soc.	50 00
Alabama	130 00
Arizona	20 00
Arkansaw	20 00
Austria	10 00
California	548 00
Canada	20 00
Connecticut	220 00
China	30 00
Colorado	40 00
Chili	10 00
Cuba	10 00
Delaware	50 00
District of Columbia	190 00
England	50 00
France	100 00
Florida	20 00
Georgia	125 00
Germany	10 00
Hawaii Islands	40 00
Illinois	3,802 00
Iowa	460 00
Indiana	355 00
Italy	10 00
Kentucky	120 00
Kansas	130 00
Louisana	60 00
Maryland	250 00
Massachusetts	395 35
Mississippi	40 00
Michigan	245 00
Mexico	20 00
Maine	190 00
Minnesota	405 00
Montana	10 00
Missouri	715 00
Miscellaneous	11 70
Nebraska	180 00
New Jersey	477 50
New York	1,515 30
North Carolina	210 25
New South Wales	30 00
North Dakota	40 00
New Hampshire	10 00
Ohio	620 00
Oregon	20 00
Pennsylvania	840 30
Paraquay	20 00
Rhode Island	25 00
Russia	30 00
South Dakota	10 00
South Carolina	130 00
Scotland	20 15
Switzerland	20 00
South America	10 00
Spain	20 00
Tennessee	290 00
Texas	170 00
Vermont	120 00
Virginia	100 00
Washington	80 00
West Virginia	10 00
Wisconsin	150 00
Am. College of Dental Surgery	10 00
Baltimore College	10 00
Chicago College	10 00
Columbia University	10 00
Louisville Dental College	20 00
New York Dental College	10 00
Ohio Dental College	10 00
University of Buffalo	10 00
University of California	10 00
University of Minnesota	10 00
University of Western Reserve	10 00
Wilmington Dental Mfg. Co.	40 00
Philadelphia College	10 00
	$15,851.55
Received from Colum. Nat'l Bank	286 06
Donations of Executive Com.	3,600 00
	$19,737 61

DISBURSEMENTS.

General Finance Committee, L. D. Shepard	$ 926 25
Executive Committee, Secretary's Expenses	3,018 89
Treasurer's Expenses	583 55
Treasurer's Bond	100 00
Secretary General's Expenses	1,299 48
State Conference Committee, J. Taft	218 87
Registration Committee, Fred. A. Levy, (per G. C. Brown.)	34 00
Invitation Committee, W. W. Barrett	16 95
Clinics Committee, C. Fr. C. Bodecker and S. R. Guilod	80 35
Biology Committee, R. R. Andrews	18 10
Nomenclature Committee, G. V. Black	31 00
History Committee, J. Taft	1,523 57
Membership Committee, E. Noyes	13 50
Publication of Transactions Committee, A. W. Harlan	4,529 95
Donations by Executive Committee, Trav. Ex	3,600 04
Woman's Department	307 00
Dental Manufacturing Co., S. S. White	121 80
Medals	720 00
Buttons and Badges	257 63
Club House	1,530 00
Banquet—Deficit	274 60
Refunded Memberships	50 00
Exchange	6 30
	$19,261 83
Paid by Columbia National Bank	286 00
Unpaid by Columbia National Bank	127 70
	$19,675 53
Balance, July 23d, 1895, in Merchants Loan and Trust Co. Bank	62 08
	$19,737 61

(Signed),

JOHN S. MARSHALL, Treasurer.

DISTINGUISHED DEAD—JAMES E. GARRETSON.

The following extract from an appreciative sketch of this exceptionally distinguished man is from the pen of the editor of the *Practitioner and Advertiser*, long a warm personal friend and admirer :

Many who knew him as the author of a system of oral surgery were unaware that he had also published a number of books, under the pseudonym of John Darby, that established his fame as a metaphysician of no mean order. Some of the John Darby books took up the most abstruse and occult subjects, and upon them he reasoned in a manner to charm the philosophical reader. His diction was so clear, graceful, and even dainty, there was such an easy, steady flow of thought, his style was so charming and winning, that there is no saying to what distinction in this field he might not have arisen, had he chosen to devote himself to it exclusively. It is difficult to imagine that the author of "The System of Oral Surgery" was the same man who wrote "Two Thousand Years After." The two works are utterly unlike in their characteristics ; the one concise, descriptive, almost prosaic, the other so speculative, so recondite, so transcendental. And yet the clearly analytical mind, the refined and purified literary taste, the delightful style of the one may be traced in the other. His were indeed rare gifts, that enabled him to shine in fields so dissimilar.

His delicacy of discernment and refinement of feeling made him to those who could comprehend him one of the most delightful of companions. He had nothing in common with grossness, and indelicacies of speech and coarseness of expression caused him to skrink within himself as if rudely assaulted. Yet no one who came into his presence could fail to be touched with the genuine kindness of heart and geniality of temperament that was a dirtinguishing characteristic of his lovable nature. Especially were the students who listened to his instructive lectures drawn toward him. They instinctively felt that he was their kind friend, and they sought his counsels and advice in every emergency. His death creates a void in many a heart that will long sigh for the sound of the voice that is stilled.

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TORONTO